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## Evaluating drivers of profitability for airlines in Latin America: A case study of Copa Airlines

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## ABSTRACT

Air Traffic demand in Latin America is expected to double over the next twenty years, yet airline profitability in the region remains highly problematic. The impediments challenging financial prosperity in the continent are numerous and have resulted in prolonged loss-making periods across most Latin American carriers. Breaking with this trend, Copa Airlines has been able to report double-digit net results for several years and recorded 56% of total profits earned by all Latin American carriers in 2016. This research has identified a number of Key Performance Indicators that have underpinned Copa Airlines' financial prosperity through a Product and Organisational Architecture (POA) framework analysis whose results were validated and elaborated upon by the CEO of Copa Airlines. Copa's sustained financial success was attributable to a number of factors. First, its geographical positioning has allowed it to engineer strong connectivity by coupling North and South America through its hub, which is reachable with narrowbodies to nearly all points in the Americas. Second, its low unit cost structure is akin to that of LCCs, operating a single aircraft type with high utilisation. Third, it has a uniquely low market concentration of competitors on its routes and capitalises on this by having a strong schedule with high frequencies together with outstanding punctuality. Fourth, it has a synergistic and fruitful cooperation with its hub airport at Tocumen. Finally it benefits from positive external factors such as a dollarized home economy with high GDP growth, exceptionally low unemployment and inflation rates ring-fenced with security. These pillars can be used as a reference for other Latin based airlines seeking to improve profitability.

## 1. Introduction

Latin America is comprised of nineteen sovereign states and the continent is a cluster of several heterogeneous operating environments. The region comprises 13% of the world's landmass, but only accounts for 5.2% of the global air passenger market, a significantly lower share when compared to Europe and the US with 26% and 24% respectively (IATA, 2018; World Bank, 2017). However airfares have fallen by more than 50% since 2002 and passenger numbers have trebled, while passenger demand in the region is forecasted to grow from 298 million in 2015 to 658 million by 2035 (ALTA, 2016). The annual travel rate per capita for Latin America is less than 1%, but the region has great potential for growth with a burgeoning middle class with higher disposable incomes encircled by an amplifying economic outlook, while the fleet is expected to more than double over the next 20 years to almost 4,500

aircraft (Ascend, 2018; CAPA, 2017; Euromonitor, 2017). The FAA (2016) reinforced the magnitude of Latin America by reporting that it remains the largest international destination for US carriers.

However airline profitability remains elusive and problematic in Latin America as it is constantly hindered by numerous challenges including: high operating costs; weak yields; very high airport charges; navigation taxes; strict and burdensome government regulations; restrictive, outdated or non-existent air service agreements; and an inefficient and outdated aviation infrastructure. As a consequence Latin American carriers continue to underperform financially. Over a 6 year period from 2011 to 2016, Latin American carriers averaged net losses of \$900,000 while in 2016 they produced an average of \$600,000 in profits, representing just 3% of global net profits of \$34.8 billion, while their counterparts in North America accounted for over 47% of net profits (IATA WATS, 2017; IATA WATS, 2014). In 2016, Latin American

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carriers earned just \$2.15 net profit per passenger, while industry-wide airlines averaged \$9.13 – more than 4 times that of Latin America (IATA WATS, 2017). The situation has not changed over the decades as Cooper et al. (1995) conducted a Delphi study in the early 1990s of Latin American airlines whose respondents rated 'generating profits' as a low priority. However, within the quagmire of underperforming Latin American carriers, Copa Airlines has been a shining star as it has attained financial prosperity combined with superior operational efficiency for sustained periods whilst operating in the continent's difficult environment. Noteworthy is that Copa Airlines' profits comprised around 56% of total profits earned by Latin American carriers in 2016, while it produced the world's 3rd strongest operating margin in 2017, registering 18% as well as the world's 3rd best net margin of 15%. In Q1 2018, it attained the world's highest operating and net margin of 20% and 19% respectively (Flightglobal, 2018; Airline Weekly, 2018). For most of the last decade it generated double-digit operating and net margins. This unprecedented and sustained profitability of a Latin American airline merited deeper investigation to uncover its differentiated strategies that underpin its prosperity in such a difficult geographical setting. The aim of this paper is to outline the key strategic drivers that underpin Copa Airlines' financial prosperity when compared with the remaining dominant carriers on the continent.

The findings may provide a blueprint of recommendations for other airlines operating in Latin America to improve their profitability. The objectives of the paper are three fold. First, to understand the Latin American air transport market by outlining the challenges and to categorise market concentration levels of the continent's seat capacity. Second, to pinpoint which elements of Copa Airlines' business model contributes to its continued profitability, when benchmarked against the remaining dominant carriers in Latin America and third, to provide supporting empirical evidence on each of the elements that positively contributes to Copa Airlines' profitability as corroborated by its CEO.

The paper is structured as follows. Section 2 defines the current situation in the Latin American market. Section 3 outlines the research methodology. Section 4 presents the results from the Pareto Analysis and Product and Organisational Architecture (POA) framework pinpointing the characteristics that specifically contribute to Copa Airlines' prolonged profitability. Section 5 outlines the specific elements that have contributed to Copa's financial prosperity, which were validated by its CEO. Section 6 concludes the research.

## 2. Understanding the Latin American air transport market

Commercial aviation within Latin America has been historically limited due to significant costs and political challenges. Firstly, fuel costs are very high, despite it being an oil producing region and prices are strictly controlled by governments. Only 4% of global aviation fuel consumption emanates from the region, resulting in insufficient bargaining power for most airlines (Recio, 2016; S&P Global Platts, 2017). Furthermore, the weakness of currencies in the region makes fuel acquisition, generally purchased in US dollars, noticeably more expensive (IATA, 2016). Secondly, international passenger taxes and charges are excessive with Argentina, Colombia, Ecuador and Peru charging \$130, \$110, \$104 and \$80 per traveller respectively (SEO Amsterdam Economics, 2016). Latin America is one of the most expensive regions in the world in terms of passenger and airline charges - in some cases, taxes and boarding fees represent more than 40% of passenger final ticket prices (CAPA, 2017). Thirdly, maintenance costs are higher than in other regions of the world due to the scarcity of Maintenance, Repair and Operations (MRO) providers across the continent (Recio, 2016). Fourthly, operational performance falls beneath their peers from other international territories. Heinz and O'Connell (2013) stated that aircraft utilisation in Latin America remains among the lowest in the world due to flying restrictions and ageing aircraft – the average age of the fleet resides at 15.6 years, compared to the Asia Pacific region at 9.6 years and the Middle East at 10.8 years (CAPA, 2017; Flightglobal, 2017;

Redpath et al., 2016). Fifthly, equity and debt financing are exorbitant for Latin American carriers due to the risky economic perception of the region coupled with depreciating currencies, which increment costs (Rodrigues et al., 2017). Lastly and importantly, burdensome regulatory conditions have slowed the prosperity and development of the continent. Due to the lack of a common regulatory mechanism in Latin America, each state has independent, bilateral or multilateral agreements, regulatory policies and ownership limitations. There are 45 different provisions for a population of 580 million inhabitants, whereas markets with similar populations (The United States or Europe) have a single directive for traffic rights (ALTA, 2016; CAPA, 2017).

To bypass these regulations, carriers have elected to franchise, which has significantly changed the landscape of aviation in Latin America over the last decade. Through franchising initiatives, Latin American carriers have enlarged their geographical footprint, allowing them to circumnavigate strict regulations across the continent and produce an extensive network within and beyond the continent. Subsequently they have contributed significantly to traffic concentration. Unlike consolidation in Europe, where groups keep separate brands, the strategy followed in Latin America has been to unify carrier branding in order to develop a pan-Latin American identity (Air Transport World, 2015; CAPA, 2016). An example of the complex LATAM franchise hierarchy is illustrated in Fig. 1. It is one of the biggest airline groups in the world in terms of network connections while the carrier has a significant presence in a large number of Latin American markets with sizable equity portfolios. The continent's Low-Cost Carriers have also replicated this strategy as VivaAerobus, for example, has initiated this arrangement with Colombian and Peruvian subsidiaries, while Volaris has imitated competitors with a Costa Rican affiliate. Copa Airlines on the other hand has not franchised, instead retaining a simplified structural organisational framework. In 2005, it acquired a 99.9% equity in Colombian based AeroRepublica and rebranded it to Copa Airlines Colombia, the second largest carrier in Colombia in terms of passengers carried. The equity partner has an operational relationship with its parent company in Panama by integrating its route network with Copa, capitalising on aircraft interchange and improving overall efficiency (Copa Airlines, 2017). In December 2016, Copa Airlines launched a new low cost carrier in Colombia called Wingo in order to diversify its offerings and compete with other such carriers from Colombia.

Another feature that distinguishes the air transport market in Latin America from the rest of the world is the concentration of the continent's seat capacity. Currently, there is a high concentration and dominance of only a few carriers, who control a large proportion of the region's capacity (ALTA, 2016). Capacity is highly skewed in particular regions, producing a geographical imbalance, which is largely attributed to the wide ranging demographic and economic macro-conditions within the continent. Fig. 2 shows the concentration of the continent's traffic as measured by ASKs for 2016. A large proportion of traffic is concentrated in Mexico and Brazil, which is correlated with the region's most populous countries with strong GDP proliferation. Brazil's population and economy account for one-third of the Latin American total while air transport comprises 28% of the total. Similarly, Mexico's population and economy account for 22% and 20% respectively of the regions' composition and has 21% of the continent's seat capacity. When Argentina, Colombia and Chile are aggregated with the two countries listed above, together they control around 70% of air traffic in Latin America – this is highly relevant because Copa Airlines from Panama generated 56% of the total profits in Latin America in 2016 without this advantage. Fig. 2 shows that Copa Airlines' domiciled hub, in Panama City has a sizable capacity throughput when compared to other cities within the continent, despite having significantly smaller GDP and population demographics. It is ideally situated on the isthmus connecting North and South America and termed the 'Hub of the Americas', which has allowed it to engineer higher levels of connecting traffic.

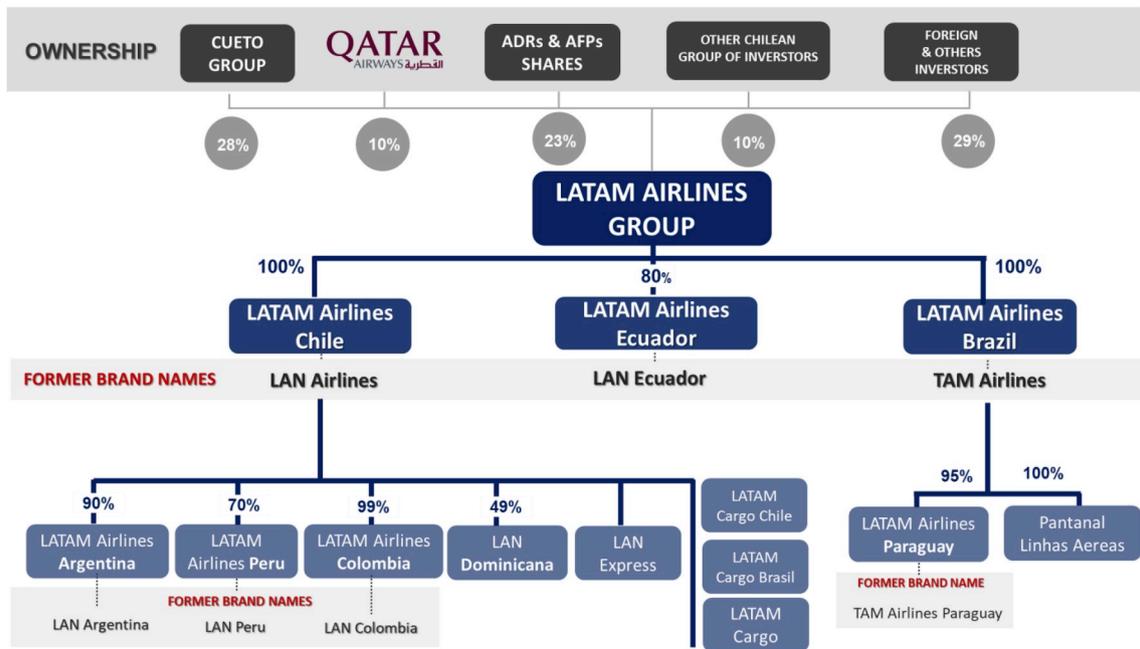


Fig. 1. LATAM airlines organisation Chart 2016.  
 Source: CAPA, 2017; flight Global, 2017; LATAM airlines group S.A., 2017.

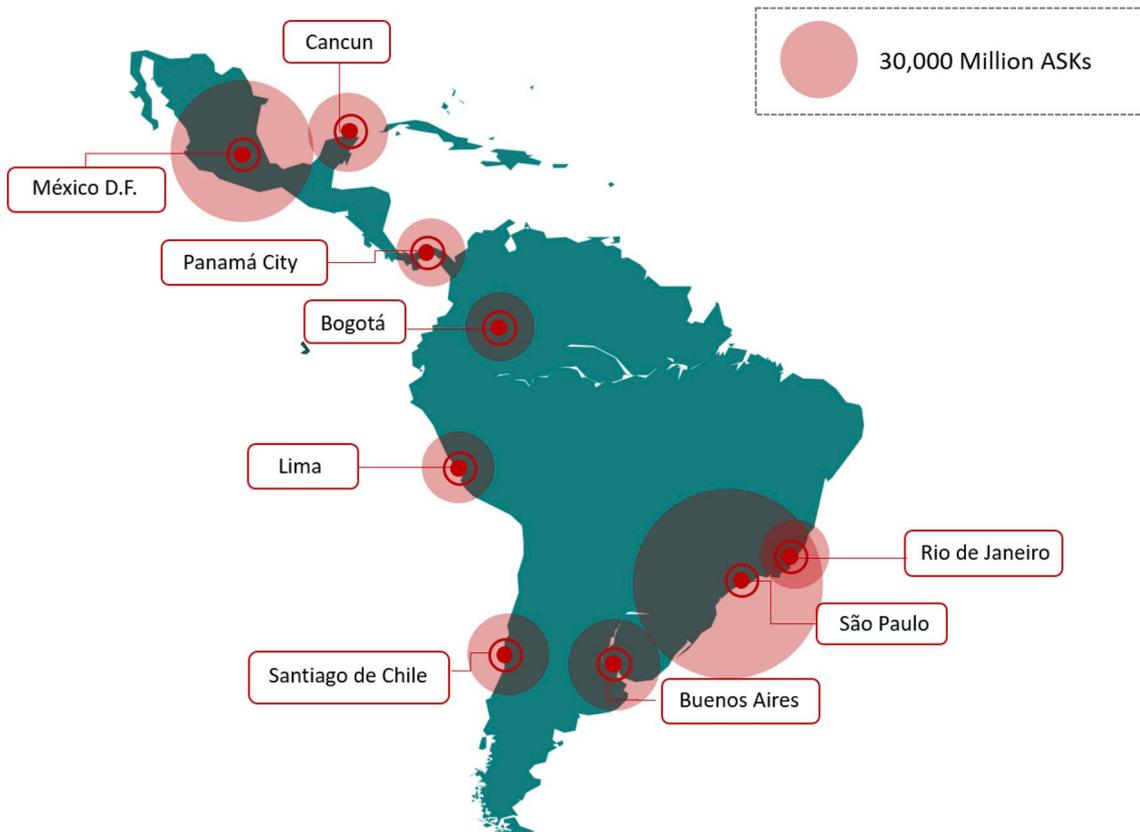


Fig. 2. Concentration of traffic in Latin America by ASKs in 2016.  
 Source: OAG analysis.

**3. Research methodology**

The second objective of this research, after having summarised the main airline business models and Copa’s position on the spectrum, is to

pinpoint which elements of Copa Airlines’ business model contributes to its continued profitability, whereby each element is benchmarked against the remaining dominant carriers within Latin America to determine the level of Copa’s relative performance. This result was

extrapolated through two phases: First, the Pareto principle (80/20 rule) was applied to narrow down the 83 operating airlines in the continent into a more manageable sample of 8 airlines that control 80% of the market, which then becomes the objects of research evaluation. The region is dominated by five main full-service airline groups notably: LATAM, Avianca, Aeromexico, Copa Airlines and Aerolineas Argentinas, accounting for about 64% of total capacity offered by Latin American carriers. When the region's three largest LCCs (Gol, Volaris and Azul) are added, these eight carriers control 80 percent of the marketplace as illustrated in Fig. 3. Fig. 4 illustrates a graphical cluster of all 83 airlines in Latin America, showing that the top 14 carriers control almost 95% of the total capacity offered, while the LCCs captured 27% of the market by 2016 (OAG, 2017).

The second phase of the research on business models has become an important aspect for both academia and management with the purpose of accurately describing a company's value generation system with a manageable number of components (Wirtz et al., 2016). Several researchers have derived a number of key elements that should be pivotal to an airline's business model, which include (with the number of key elements<sup>1</sup>): Mason and Morrison (2008) (11 key elements<sup>1</sup>); Daft and Albers (2013) (7); Lohmann and Koo (2013) (6); Daft and Albers (2015) (8); Jean and Lohmann (2016) (6) and Corbo (2017) (10). Soyk et al. (2018) conclude that two different airline business model frameworks have been developed and applied from an industry-specific perspective. Firstly, Mason and Morrison (2008) developed the Product and Organisational Architecture framework, which differentiates between the product and the organisational architecture of an airline. The product aspect contains service quality elements that relate the product to consumer preferences, namely connectivity, convenience, and comfort. The organisational architecture describes the vertical structure, production and distribution/sales elements. The second key airline-related framework stems from Daft and Albers (2013, 2015) and it differentiates between corporate core logic, configuration of value chain activities and assets. The most popularised methodology in the literature adopted the Mason and Morrison approach as it was applied by: Lohmann and Koo (2013) on US carriers; Heinz and O'Connell (2013) on African carriers; Lenartowicz et al. (2013) on EU low cost carriers. Meanwhile Meichsner et al. (2018) also adopted the concept on African carriers where a POA model was applied to highlight the importance of each characteristic to the airlines' overall performance for the five largest African full service airlines.

Thus a Product and Organisational Architecture (POA) model analysis was performed on the six largest Latin American airlines (excluding

and Morrison (2008) was extensively developed to capture a wider range of factors including ancillary revenues. It was also evolved to incorporate external factors that include economic, political and macroeconomic impacts, which are pertinent to the Latin American market and constitute a major reasoning for the underperforming domiciled carriers that operate there. Fig. 5 illustrates the adapted POA model structure that was applied.

The methodology employed to calculate the relevant indices to benchmark the performance of the sampled airlines includes four different steps, following Mason and Morrison (2008) guidelines:

### 3.1. Data collection of the performance metrics (POA)

To measure each of the performance indices, data from different sources has been defined and calculated. Table 1 gives a summary of the applied indices and metrics, while Table 3 in the Annex outlines the calculations for the performance ratios of the airlines in 2016 used in the POA modelling.

### 3.2. Benchmark ratios calculation (POA)

The performance metric data listed in Table 1 was benchmarked against other Latin America carriers. This paper capitalised on the methodology developed by Mason and Morrison (2008). They used different scales for CASK and Yield to perform the benchmarking analysis and therefore the revised evaluation used in this study is more robust and consistent, leading to more accurate and comparable results. This research has corrected the methodological problem, by using a consistent scale which captured a wider calibration ranging from 0 (worst in class) to 1 (best in class). Depending on the features of the data, the highest or, on the contrary, the lowest scores will be used as the "best in class" performer – for example lower values of CASK indicate a better performance. The methodology for the benchmarking ratios is shown in Table 2. Table 4 in the Annex outlines the calculations for the benchmark ratios for 2016.

### 3.3. Weighted ratios calculation (POA)

After calculating the benchmarking ratios, each item result was assigned a weight in relation with the impact that it has on the profitability of the airline. Therefore metrics are weighted based on a correlation of the benchmark item against profitability.

$$\text{Weighted Index Score} = \frac{\sum_{i=1}^n \omega_i x_i}{\sum_{i=1}^n \omega_i} \left( \text{Where } \omega \text{ is the weight and } x \text{ the benchmark item score} \right)$$

Aerolineas Argentinas<sup>2</sup>), that accounted for 80% of total traffic in the continent as depicted in the Pareto analysis above. Each key element in the POA is evaluated through a conceptual framework whereby the importance of each item to overall performance is assessed and benchmarked against the main dominant Latin American airlines that provide 80% of overall capacity. The earlier POA model engineered by Mason

### 3.4. Final ratios calculation (POA)

Weighted indices are benchmarked with the best performer for each key element in the analysis. As a result, the final index to be obtained was calculated with the following equation:

$$\text{Final Index Score} = \frac{(\text{weighted score})}{(\text{best weighted score})} \times 10$$

Table 5 in the Annex outlines the calculations for the final scores pertaining to 2016 data.

<sup>1</sup> Profitability, Cost drivers, Revenue, Connectivity, Convenience, Comfort, Distribution and sales, Aircraft, Labour, Airport attractiveness and Market structure.

<sup>2</sup> The Argentinean flag carrier was not analysed as there was very limited public data available because of its 100% state ownership structure.

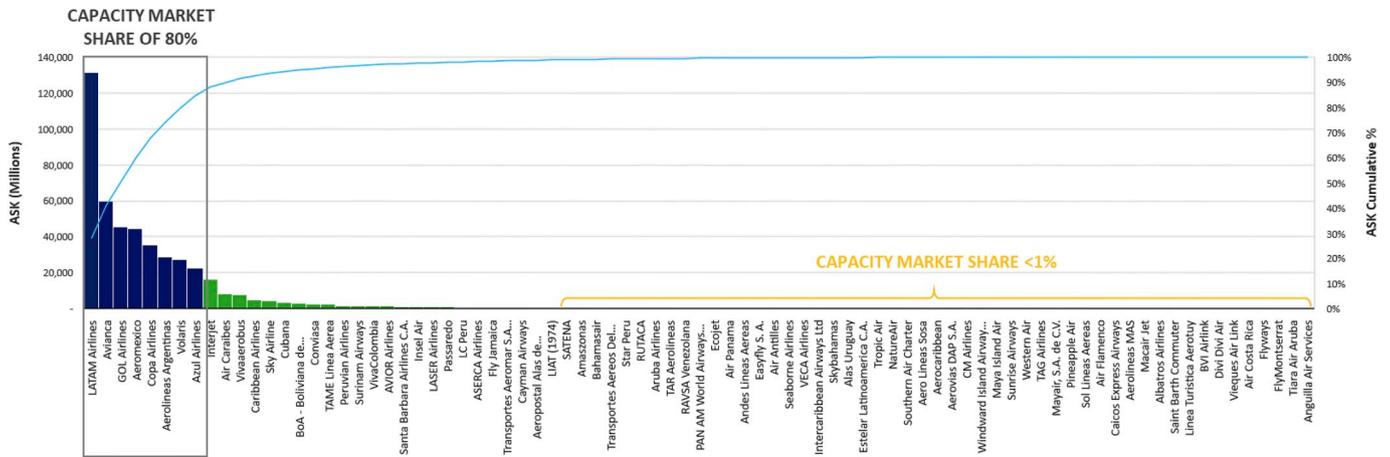


Fig. 3. Pareto analysis of Latin American Airlines in 2016  
Source: OAG analysis.



Fig. 4. Graphical Cluster of all 83 airlines in Latin America 2016.  
Source: OAG.

4. Deductions from the POA data

The applied analysis is summarised into radar plots to depict the key elements between Copa Airlines and the large dominant carriers within Latin America, which were further separated by their business models depicting full service and low cost carriers. The results of the data are illustrated over a time line taken from 2012, 2014 and 2016, which are correspondingly illustrated in Figs. 6–8 respectively. There are specific patterns emerging as the analysis detects that the region’s full service airlines share common characteristics, while the LCCs share a unique set of different indices. The full service network airlines show a strong performance in the product architecture area as these carriers have employed product differentiation strategies that include: offering a high level of *connectivity permutations* (routes, network density, code sharing); *convenience* (frequency, punctuality, airport attractiveness); together with *comfort* (on-board services, seating and quality).

Connectivity permutations are a core competency of the hub and

spoke apparatus of full service airlines throughout the world including Latin America as it facilitates the seamless movement of passengers through a central hub. The science involves the synchronisation of incoming flights to provide maximum feed for departing aircraft (narrowbody or widebody) waiting to take-up their multi-origin share of incoming passengers. This form of scheduling creates a bank of many incoming flights arriving almost simultaneously, followed by a wave of departures. When traffic is aggregated from code share agreements or through alliance/equity partnerships, it produces an even larger traffic multiplier and is a major element in the ethos of Latin American carriers as depicted in Figs. 6–8 (Akca, 2018; O’Connell and Bueno, 2016; Logothetis and Miyoshi, 2016; Alderighi et al., 2005; Dennis, 1994). Aeromexico has the most connected airline hub in Latin America serving over 95 destinations, of which 43 points in its network reached domestic points. Over one-third of its traffic is now connecting through its hub airport, up considerably from 21% which it achieved in 2010 according to MIDT data. Mexico has the 11th largest domestic market in the world

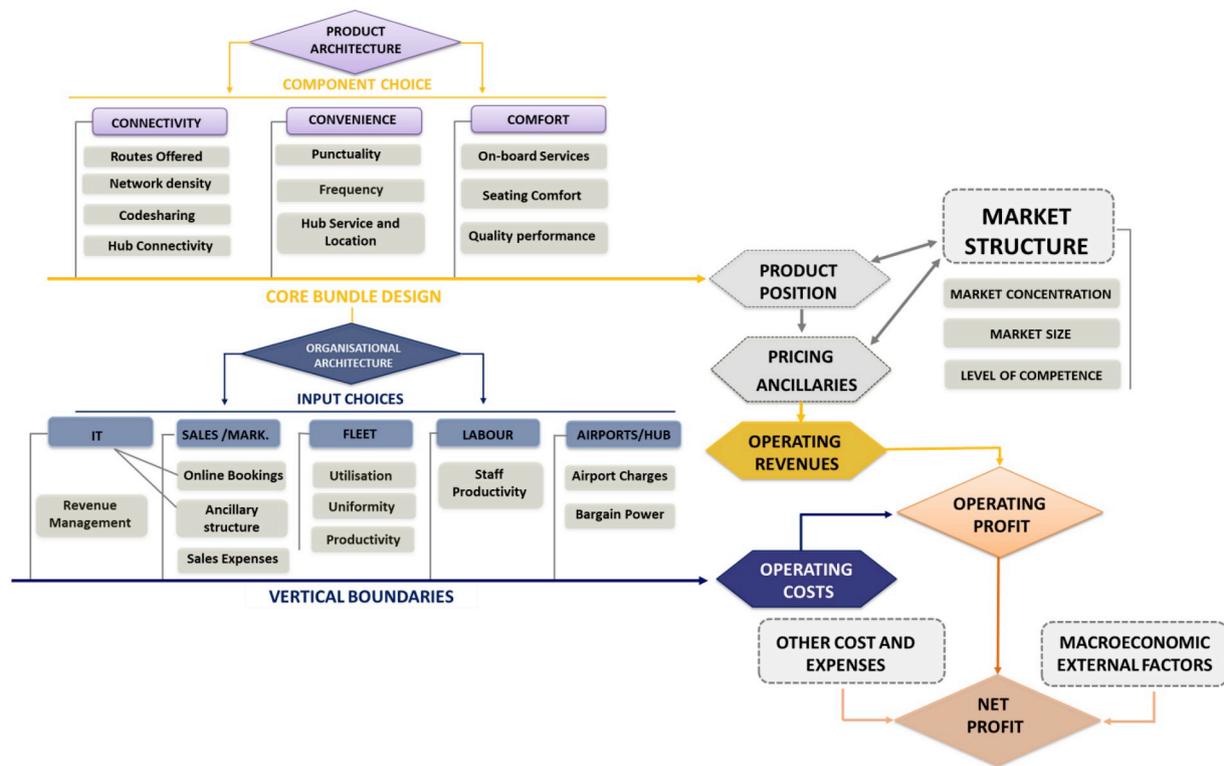


Fig. 5. Adaptation of the product and organisational architecture model for airlines.

Table 1  
Summary of applied indices and metrics.

INDEX	METRICS
OPERATING PROFITABILITY INDEX	Operating Ratio
OPERATING REVENUES STRUCTURE INDEX	Yield
OPERATING COST STRUCTURE INDEX	CASK and Fuel expenses/ASK
CONNECTIVITY INDEX	Departures/airport/day, routes offered, code sharing routes offered, average departures/hour at hub and waves of flights at the hub
CONVENIENCE INDEX	Average weekly frequencies/route, punctuality, average percentage of business passengers/route and Hub services and Customer Satisfaction
COMFORT INDEX	Customer Service rating, economy seat width and pitch and availability of Wi-Fi onboard
SALES & DISTRIBUTION STRUCTURE INDEX	Percentage of online bookings and airline's average cost of ticketing, sales and promotion per passenger
FLEET PRODUCTIVITY INDEX	Average utilisation rate, average aircraft sectors per day, aircraft type uniformity and average aircraft age
LABOUR PRODUCTIVITY INDEX	Passenger/employee, employee/aircraft, and ASK/employee
AIRPORT ATTRACTIVENESS INDEX	Airport and navigational charges/passenger, percentage of traffic controlled by airline alliance at the hub and weighted average annual passenger at the hub
MARKET STRUCTURE INDEX	Percentage of city pair routes that are monopolies, average number of operators per route and capacity share per route
ANCILLARY STRUCTURE INDEX	Percentage of the ancillaries over the total turnover and average ancillary revenue per passenger
EXTERNAL FACTORS INDEX	Local currency exchange rate, weighted GDP per capita, inflation and unemployment rate

in terms of seat capacity but it is the international seat capacity (over 50%) that is now beginning to overtake and gain more traction as Aeromexico expands its international footprint.

Convenience was another important performance indicator for the full service airlines as research by Medina-Muñoz et al. (2018) found that there were 16 previous studies that depicted that the flight schedule including frequency is considered an important entity, when choosing an airline or a flight, while 11 such studies identified punctuality. Convenience remains an embedded differentiator of Latin American carriers. Aeromexico and Avianca are forming JVs with American based airlines under anti-trust immunity, which allows them to align frequent flyer programs, integrate services, coordinate pricing and flight schedules while at the same time improve airport facilities, which inevitably make services more convenient for passengers.

Providing comfort and service quality has become pinnacle in remaining competitive. The full service airlines rely on producing added value and consumer-driven product differentiation beyond the basics of the LCC product (Belobaba, 2016; Pearson and Merkert, 2014; Merkert and Hensher, 2011; O'Connell, 2011; Forsyth and Dwyer, 2010). The delivery of high-quality service is essential for the survival of full service airlines, which facilitates in gaining and maintaining customer satisfaction and loyalty. It also leads to creating competitive pressure among airlines (Clemes et al., 2008; Chen et al., 2011). Avianca, for example, was recognised as 'One of the Best Airlines in the World' by the Condé Nast Traveller magazine in 2016, while one of its corporate statements is to provide an 'Exceptional Experience' to its passengers. In 2017, Avianca was recognised by Skytrax, TripAdvisor and OCU for different aspects of outstanding service and high customer perceptions (Avianca holdings, 2018; The European, 2019). Meanwhile LATAM is initiating a record investment of \$400 million to transform the cabins and offer the best travel experience (LATAM, 2018). High comfort standards are an ingrained commitment to passengers who travel with Latin American full service airlines as portrayed in Figures, 6, 7 and 8.

However, these full service carriers have obtained lower scores in the organisational architecture segment especially in such areas as labour

**Table 2**  
Developed POA equations.

PREVIOUS STUDIES METHODOLOGY	DEVELOPED METHODOLOGY
<p><b>Original Equations</b></p> $B.R._{MAX} = \frac{\text{Airline X performance}}{\text{Best in class performance}}$ $B.R._{MIN} = \frac{\text{Worst in class} - \text{Airline X performance}}{\text{Worst in class} - \text{Best in Class}}$ <p><i>Mason &amp; Morrison (2008)</i></p>	<p><b>Developed Equations</b></p> $B.R._{MAX} = \frac{\text{Airline X performance} - \text{Worst in Class}}{\text{Best in class performance} - \text{Worst in Class}}$ $B.R._{MIN} = \frac{\text{Worst in class} - \text{Airline X performance}}{\text{Worst in class} - \text{Best in Class}}$ <p><i>Author (2017)</i></p>
<p><b>B.R. MIN:</b> Benchmarking Ratio MINIMUM score is "best in class"</p> <p><b>B.R. MAX:</b> Benchmarking Ratio when MAXIMUM score is "best in class"</p>	
<p><b>ORIGINAL SCALES</b></p>	<p><b>DEVELOPED SCALES</b></p>
<p><b>CASK</b> Index is a representation of a <b>MINIMUM</b> benchmark ratio.</p> <p><b>Yield</b> Index is a representation of a <b>MAXIMUM</b> benchmark ratio.</p>	

productivity, sales and distribution optimisation and airport charges, which mirror similar such attributes found in other full service network airlines around the world (Efthymiou and Papatheodorou, 2018; O'Connell and Bueno, 2016; Gillen, 2005, 2011; O'Connell, 2006, 2011; Doganis, 2010; Morrell, 2005; Hanlon, 1996). Despite showing the strongest revenues, these full service carriers have an inefficient cost structure, weak market structure (traffic concentration) and an unfavourable external environment, which are the primary drivers in delivering the underperforming profits. An inefficient cost structure is commonplace across these Latin American full service airlines, triggered by the usual characteristics associated with legacy carriers such as high labour costs and overstaffing as they have some of the highest ratios of employees per passenger or employees per aircraft. Aerolineas Argentinas, for example transports just 755 passengers per employee, while Gol has a highly productive workforce resulting in a ratio of 2,187 passengers per fulltime equivalent employee for 2018 (Gol, 2018; CAPA, 2019). Volaris, has one of the best ratios for labour productivity, with only 66 employees per aircraft, compared to 125–150 for the FSCs. They are also characterised by aging aircraft that reduce utilisation rates and increase maintenance costs.

Meanwhile the Latin American low cost carriers reflect a different set of structural dimensions, operating characteristics and specifications. They enshrine the concept of 'low cost' into their organisational culture and apply simplicity into their operational manifest with attributes such as simplified fleet (one aircraft type) and point-to-point routings, for example. The Latin American based LCCs in Figs. 6–8 illustrate that they have thrived in the organisational architecture area, capitalising in a number of metrics that include: use of *secondary airports*; *high aircraft*

*utilisation*; *strong online sales penetration*; and *ancillary revenues*. Low cost carriers from Latin America strive to use airports with low aeronautical charges, a lack of congestion and those that have the ability to facilitate quick aircraft turnarounds. They have the flexibility to negotiate favourable airport charges, especially when in competition with other airports. Mason and Morrison (2008) found that four airport related factors (airport cost, airport size, number of competing airlines and monopoly routes) were key elements underpinning the LCC model. VivaColombia, for example, is operating into the newer Panama Pacifico Airport in place of Tocumen International Airport in Panama. Warnock-Smith and Potter (2005) found that by avoiding congested airports, LCCs may achieve aircraft productivity that is more than 50% greater than that of their full service counterparts.

High aircraft utilisation is a preeminent feature of LCCs throughout the world including Latin America, which allows them to generate more revenue and dilute fixed costs like depreciation, insurance and overheads. Zuidberg (2014) conducted an econometric analysis of the costs associated with operating an aircraft and found quantifiably that airlines can achieve noticeable cost savings per aircraft by maximising its utilisation rate. Mantin and Wang (2012) found a positive relationship between aircraft utilisation and profitability. Gol and Volaris operated their aircraft 11.8 and 13.2 block hours per day respectively in 2018, compared to Avianca's 9.7 block hours (Avianca holdings, 2018; Gol, 2018; Volaris, 2018).

A high proportion of online sales is another cornerstone in the LCC toolbox to contain costs and this is representative in the Latin American market as Gol and Azul sold 82% and 85% respectively of its seat inventory through its web and app interfaces in 2018. Meanwhile, Avianca

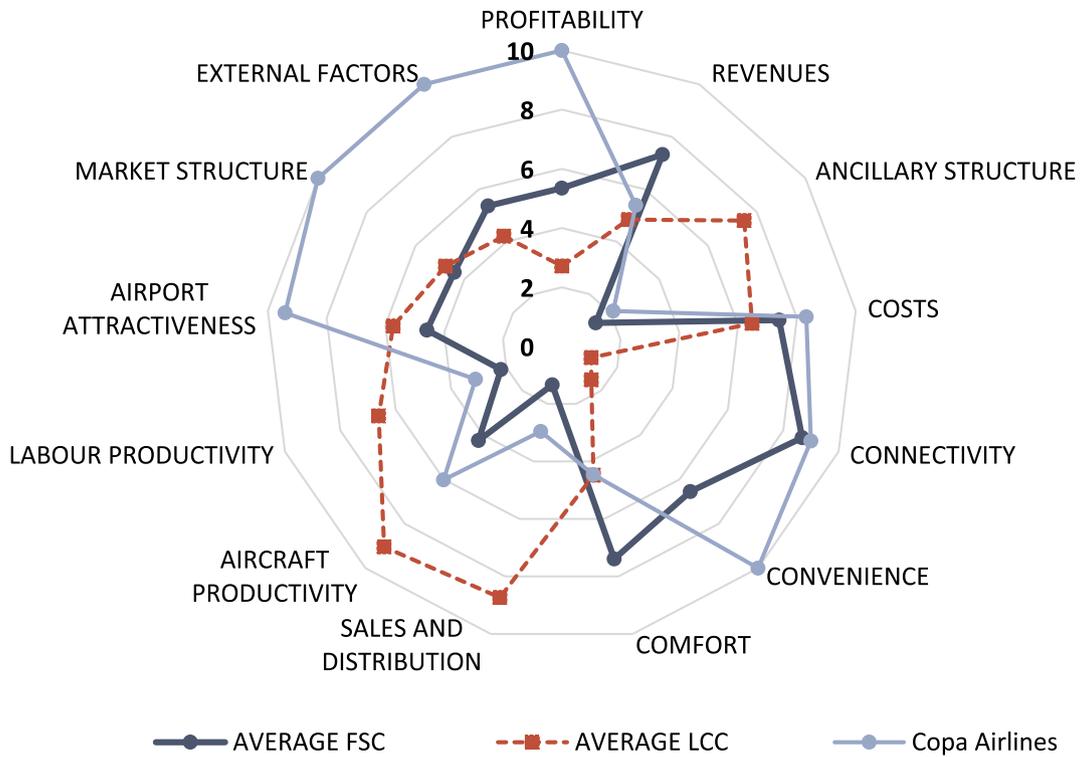


Fig. 6. Overview of averaged POA results for Latin American FSCs, LCCs and Copa Airlines in 2012.

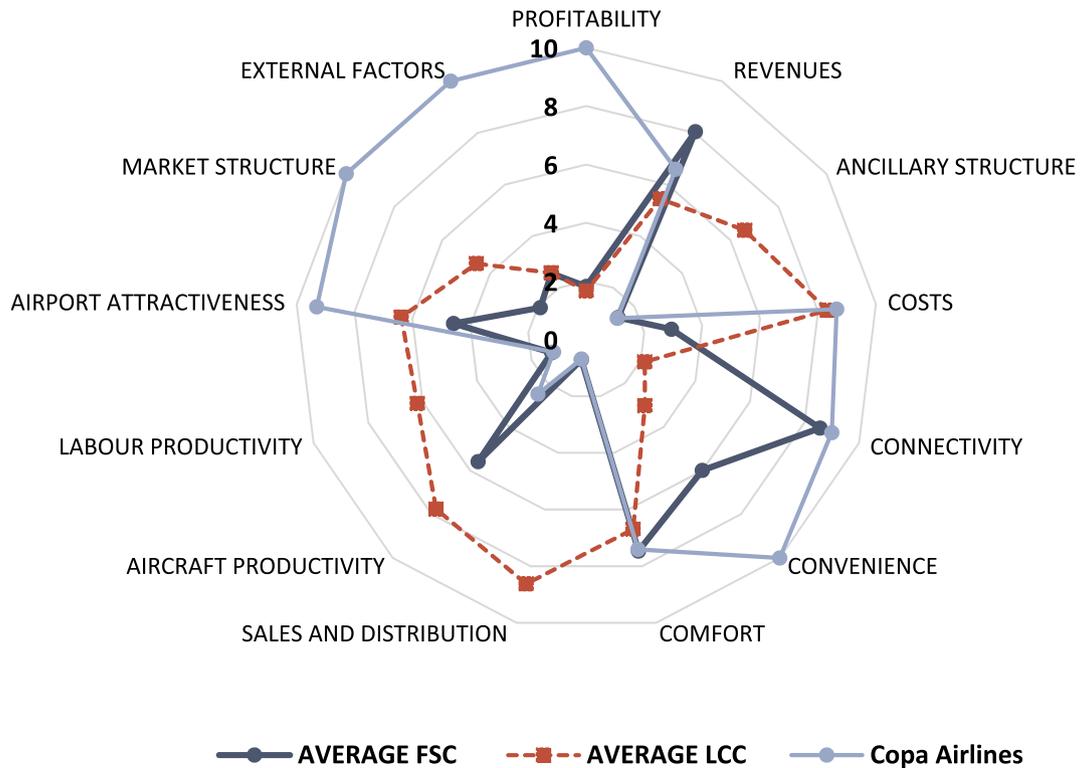


Fig. 7. Overview of averaged POA results for Latin American FSCs, LCCs and Copa Airlines in 2014.

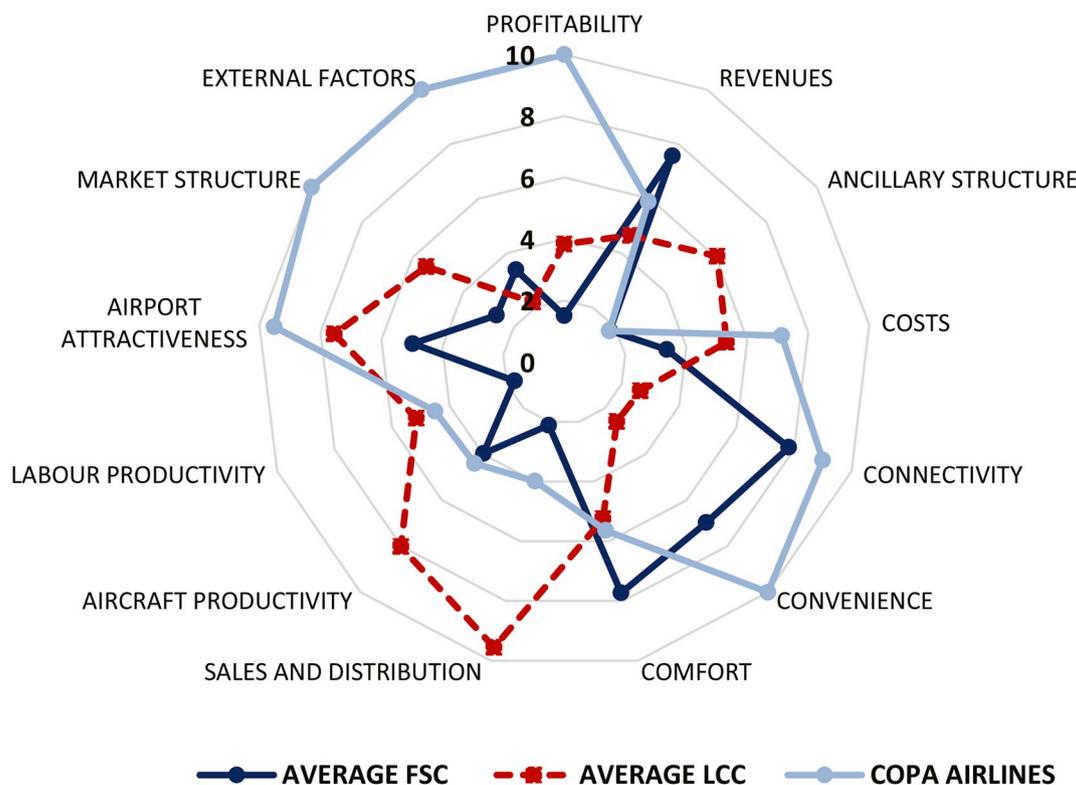


Fig. 8. Overview of averaged POA results for Latin American FSCs, LCCs and Copa Airlines in 2016.

only managed 21.5% because of its heavy reliance on expensive GDS intermediaries that are largely affiliated to full service carriers (Azul, 2018; Avianca holdings, 2018; Gol, 2018). Hanke (2016) argues that online shoppers paid on average 11.5% less than customers buying their airfare tickets through a 3rd party. Chong and Law (2018) found that the combination of the ease and perceived lower cost of booking a ticket through a LCC website was a key determinant for purchase.

Ancillary revenues have now become an integral and sustainable component of the low cost carrier business model (O'Connell and Warnock-Smith, 2013). Volaris, earned over one-third of its revenues from ancillaries during the first half of 2019, while Azul generated \$24.40 per passenger in 2018 (Azul, 2018; Flightglobal, 2019). Warnock-Smith et al. (2017) found through a survey that 'a la carte' products that are predominately offered by LCCs such as baggage, seat assignment, leg room, etc, received a high 'willingness to pay' from passengers and the concept is increasingly being accepted by the public as the traveling norm. Other features pertinent to LCCs include rigorous cost control, which is also highly evident within the Latin American based LCCs (Pearson et al., 2015; Pearson and Merkert, 2014; de Wit and Zuidberg, 2012; Doganis, 2010; Dennis, 2007; O'Connell and Williams, 2005; Lawton, 2002).

However, Copa Airlines revealed some contrasting 'best in class' metrics when benchmarked against the dominant FSCs and LCCs that operate in Latin America as illustrated in Figs. 6–8. It shows that Copa has remained relatively steadfast, with little deviance from its performance indices between 2012 and 2016. It is a forthright leader in profitability, connectivity, airport attractiveness, market structure, external factors and convenience when benchmarked against the other Latin American incumbents. Each of these factors will be further investigated in the next section as the final objective of the research was to provide supporting empirical evidence as to why these particular elements positively contributed to Copa Airlines' profitability. The resulting analysis was discussed with Copa's CEO to substantiate the

findings and to provide an authoritative opinion.

### 5. Copa Airlines performance indicators and its formula for success

This section delves deeper into those main indicators (connectivity, airport attractiveness, market structure, external factors and convenience) that positively impact Copa Airlines financial dominance. The resulting analysis was shared with Copa Airlines CEO, Pedro Heilbron through an interview who provided more insightful and comprehensive inputs. The scrutiny starts with a brief background to the Panamanian incumbent. The possible limitation of applying inputs from high level management into single case study analyses is the potential generalization and utility concerns that originate from such an endeavour. The authors' intent was to underpin the quantitative POA benchmarking analysis with a qualitative narrative from the CEO. Without the CEO having any prior knowledge of the POA results, a corroborating narrative from him would serve to further validate the POA results. This approach ensures the tripartite ensemble of epistemological, ontological and axiological applications of involving a CEO to provide validity to the study.

#### 5.1. Background

Copa Airlines commenced operations 71 years ago with the help of Pan Am, which provided technical and capital assistance. Initially, Copa served three domestic destinations in Panama and in the 1960s, it began international services. During the 1980s, Copa suspended its domestic services to focus on international flights. It began strengthening its international markets, through a comprehensive Skyteam alliance with Continental Airlines in 1998, which acquired 49% of Copa's shares. This synergy allowed the two carriers to extensively code share, perform joint marketing and exchange technical expertise (Copa Airlines, 2017).

When Continental merged with United Airlines (Star alliance) in 2009, the Panamanian incumbent then aligned its network and Frequent Flyer Program with United. Copa launched an IPO in December 2005 and today it has a market capitalisation of \$3.3 billion (Nasdaq, 2018). In 2017, Copa transported 9.5 million passengers, double the number carried in 2008 with 78 737s (different variants) and 15 E190s with an average age of 8.1 years, while it has a further 61,737 Max on order. Author calculations determine that Copa's unit costs are exceptional because, despite being a full service airline, it has a CASK<sup>3</sup> similar to established LCCs such as easyJet and JetBlue while the utilisation per aircraft is high, averaging 12.2 h per day in 2018. It currently operates around 350 daily scheduled flights to 78 destinations in 32 countries through its own metal to South, Central and North America as well as the Caribbean and through its affiliation with the Star alliance, it is able to extend its network reach to 146 international destinations through additional code share agreements (Copa Holdings, 2018). It generates over 97% of its revenues from passengers, while income from cargo operations comprises just over 2%, with the remaining 1% coming from ancillaries. It plans to grow its ancillary revenues by a factor of three, however, reaching \$50 million by 2019 (Flightglobal, 2018; Copa Holdings, 2018). Its prolific growth is noteworthy as OAG scrutiny reveals that it has seen a sevenfold increase in its capacity (ASKs) since 2000. This continuous growth has largely been made possible by the success of its hub, which has made Tocumen International Airport into Latin America's leading gateway, while also reinforcing Panama's status as a strategic center for connectivity, logistics and trade in the Americas. Copa's CEO Pedro Heilbron added some additional key factors that had positively impacted Copa's fortunes including: a world class product and strong brand together with a senior management team that has been in-situ for many decades, keeping the long term strategy aligned and focused. Copa's goal-oriented culture and incentive programs have contributed to a motivated work force focused on satisfying customers, achieving efficiencies and growing profitability. In addition when corporate operational and financial targets are met, employees are eligible to receive bonuses depending on the amount of profits generated (Heilbron, 2017; Copa Holdings, 2018).

## 5.2. Connectivity

One of the defining attributes is Panama's geographical positioning which provides a unique fulcrum connecting North and South America that is reachable with narrowbodies to nearly all points across the Americas, while the CEO emphasised that Panama's geography is Copa Airlines' greatest asset and the vision of the Panamanian incumbent is to harness this opportunity. Heilbron (2017) stated that Copa operates aircraft very effectively by placing the right sized aircraft for the market with a frequent service, serving a combination of both the principal cities of Latin America and a growing number of secondary cities as it capitalises on its geography. Copa's use of narrowbody aircraft on long haul routes (sectors over 4,500 km) produces world-record breaking accolades as it schedules 437 weekly long haul narrowbody flights from its Panama hub, which is 127 more departures than second placed United Airlines and 227 more than American Airlines and tripling that of Icelandair (Anna.aero, 2018). This positively impacts its seat mile costs and aircraft utilisation rates. Copa's hub allows it to consolidate traffic and provide non-stop or one-stop connecting services on over 2,000 city pairs. This strategy has allowed Panama City to become one of the most connected cities in the Americas. Copa Airlines serves 72 airports in the Americas while more than half of these routes (38) are operated with an average of a daily service and an additional 15 are operated with 3 daily services or more. Heilbron (2017) stated that Copa in 2011 switched from a four-bank hub structure to a six-bank structure facilitating

<sup>3</sup> The lower values of CASK for Copa in Figs. 6–8 indicate a better performance on the radar plots.

convenient early morning and afternoon flight waves, while its minimum connecting time is around 70 min (OAG, 2017). Its load factors averaged 81% and are considered high as Wanke and Barros (2016) researched that load factors are generally low within Latin American airlines. Data calculated from a MIDT database found that Copa Airlines carried 2.5 million passengers between North America and South America via its hub at Tocumen airport in 2017 generating almost \$844 million. It also transported over 830,000 passengers between North America and Central America reaping \$223 million, while 154,000 transited its hub between North America and Caribbean destinations in 2017. Approximately 500,000 passengers traveling on Copa Airlines from North America terminated their journeys' in Panama in the same year (Sabre, 2018).

## 5.3. Airport attractiveness

Perelman and Serebrisky (2010) concluded that Latin American airports were less efficient than Asian and North American airports. Furthermore, the region has important infrastructure challenges: airports have insufficient capacity for the current and forecasted increase in traffic in the region and there is a scarcity of secondary airports to absorb this growth, encompassed by a regulatory burden across the continent (CAPA, 2017; IATA, 2016). However, IATA (2017) states that Panama has the best air transport infrastructure in Latin America and 6th best in the world. Heilbron (2017) stresses the importance of such strong infrastructure by indicating that Tocumen<sup>4</sup> was only unavailable for flight operations for just 2 h per year over the last few years. The CEO highlights the benefits of its unconstrained hub, which is the only airport in Central America with two operational runways at sea level altitude allowing aircraft to operate with full payload without any performance restrictions which would occur at higher altitude airports. Panama has year round good weather, boosting their flight completion factors. At Tocumen international airport, Copa has a seat on the board of the semi-autonomous airport corporation and Heilbron asserts that the co-operation between the two is very synergistic. Heilbron (2017) further illustrated that the airport has invested over \$1 billion in a new terminal, which has alleviated the pressure on a domiciled home based carrier by constructing 20 additional gates, which will enable the airport to have 54 contact gates, allowing its overall capacity to grow from its present 14 million to 21 million passengers. Traffic at Tocumen has been growing at a CAGR of 13.3% since 2003 and there is a visionary master-plan underway to build a third runway together with a new cargo facility and a duty free zone by 2024. This bipartisan relationship between Copa and the airport allows for synchronised expansion, while Aviation Strategy (2012) indicated that Copa benefits from the highly competitive user fees at Tocumen.

## 5.4. Market structure

Another key strength of Copa Airlines is its strategy to focus on underserved thin markets between North, Central, South America and the Caribbean. OAG analysis reveals that Copa has a complete monopoly on over 70% of their routes, far superior to that of their peers in the region. Heilbron (2017) states it takes full advantage of being the only operator on the route. The average number of operators per route is just 1.7,

<sup>4</sup> There are five airports in Panama that provide international services, namely Tocumen, Balboa, Bocas Del Toro, David and Panama City Paitilla. Nevertheless, Tocumen International Airport controls 94% of the country's scheduled seat capacity but virtually all international flights use Tocumen making it Panama's gateway. Copa controls 81% and 75% of seats and flights respectively (OAG, 2017). Tocumen is serviced by 16 international airlines, 15 of which are full service carriers while US based Spirit Airlines is the only LCC operating. In 2017, it was the 10th largest airport in Latin America in terms of scheduled seats with 9.4 million seats slightly behind Rio de Janeiro.

which is abundantly lower than its full service competitors (OAG, 2017). Analysis affirmed that it has a 50% share in 45% of its markets, while 65% of its passengers emanate from these markets. Heilbron (2017) also states that it code shares with 13 carriers, while it has a comprehensive agreement with United Airlines on 124 routes. Copa has had an antitrust immunity partnership with United Airlines since 2001 on which it shares a reciprocal FFP and it also encourages cooperation in marketing and other operational initiatives. It launched its own FFP in 2015 which succeeded its predecessor under the auspices of United Airlines (MileagePlus) and rolled out a co-branded joint product in most of Latin America, which enabled Copa to develop brand loyalty among travelers. The co-branding of the MileagePlus loyalty program helped Copa to leverage the brand recognition that Continental (merged into United) already enjoyed across Latin America and has enabled Copa to compete more effectively against regional competitors such as Avianca and the Oneworld alliance represented by American Airlines and LATAM Airlines (Heilbron, 2017).

### 5.5. External factors

The region is dependent on low-income economies with weak currencies, high inflation and steep taxes. However, Panama has a dollarized home economy with average GDP growth of around 7% from 2012 to 2016 together with an exceptionally low unemployment rate of 2.7% and annual inflation of 2.9% (IMF, 2017). Heilbron (2017) emphasises that the connectivity that Copa generates supports the country's strong GDP growth and spreads economic and social benefits across Panama and Latin America. Oxford Economics (2017) states that aviation contributes \$7.3 billion to Panama's GDP annually, representing almost 15% of its total GDP. It is the second most competitive economy in Latin America (after Costa Rica) based on World Economic Forum's Global Competitiveness Index for 2017/18, which tracks over 100 indicators whose aggregated scores have positively contributed to the external factors of the POA model for Copa (World Economic Forum, 2017). Panama has been ranked by the IMF, World Economic Forum and the Latin Business Chronicle as one of the most competitive and globalised economies in Latin America based on factors such as direct foreign investment, international trade, GDP growth, low inflation and security (Euromonitor, 2017). These factors have contributed to Copa's success as Aguilera et al. (2016) identified that the Panamanian flag carrier is the 21st most internationalised company in Latin America, deriving the majority of its sales from outside its home country and by having a strong presence in multiple countries.

### 5.6. Convenience

Copa Airlines is the 3rd most punctual (On Time Performance) airline in the world at 86.4% in 2017 and most punctual carrier in Latin America for the fourth consecutive year (OAG, 2018; CNN, 2018). Equally its completion factors have been steadily over 99.7% for the last few years making it amongst the best in the global industry (Heilbron, 2017). It has exponentially grown its frequencies over the last decade from 30,000 in 2006 to 120,000 by 2016 (OAG, 2018). It offers all of the trimmings of a full service product as its in-flight products include: Audio-Video-on-Demand (AVOD) screens at every seat; inclusive multi course meals; complimentary alcoholic drinks; pillows and blankets. Business Class on the 737s is equipped with: reclining leather seats attached with footrests and adjustable headrests; a 110-V power outlet; and a USB port. The CEO states that having a consistent product is very important and this strategy is reflected in its regional Embraer aircraft, which has a similar business class product to the 737s with a four abreast seating configuration that has a 40-inch pitch. Heilbron (2017) states that customer satisfaction is extremely high as the passengers have a value enabling full service product that exceeds their expectation as Copa's average fares have fallen from \$223.50 in 2013 to \$173.40 by 2017 as indicated in their annual report (Copa Airlines, 2018). Its

passenger segmentation gives it a differentiated advantage as 40% of its travelers partake on journeys for business purposes, while only 10% of its offered capacity is business class. It has received accolades from Skytrax for the best airline in Central America and the Caribbean for three consecutive years, while it also received awards for Best Airline Staff Service in Central America/Caribbean (Copa Airlines, 2018).

## 6. Recommendations, contributions, conclusions and limitations

The Latin American air transport market is expected to double in traffic over the next two decades. However, it is marred by a wide range of impediments, ranging from: regulatory barriers, operational inefficiencies, high taxes, monopoly controlled suppliers, tight liquidity, inadequate infrastructure and exposure to external influences such as low income economies, weak currencies and low GDP growth rates. Subsequently the profits generated by Latin American carriers are minuscule in comparison to their North American and European counterparts.

### 6.1. Contributions

This research is based on commercial datasets that are layered into an academic contextual framework. The research is significant as it depicts the dominant carriers within Latin America and assigns a wide spectrum of indices that govern their commercial performance, which is graphically illustrated through radar plots. A Product and Organisational Architecture (POA) framework was employed to detect 'best-in-class' benchmark comparisons of the seven most represented airlines within Latin America for the first time, accounting for 80% of the overall capacity.

### 6.2. Conclusions

Three core findings unfolded from the research: Firstly, the three major full service network airlines comprising LATAM, Avianca and Aeromexico all shared common characteristics within the POA framework, whereby attributes such as connectivity, convenience and comfort performed well; Secondly, the low cost carriers displayed different patterns where they excelled in areas such as productivity, online sales and secondary airports, but underperformed in the product architecture areas where the network airlines gained the most value; Thirdly, it was found that Copa Airlines has been Latin America's financially outperforming carrier over many decades, accounting for over half of total profits for Latin American carriers in 2016, thereby warranting deeper investigation. Further penetrative analysis was conducted with the POA results being qualitatively corroborated by the CEO of Copa Airlines. The results produced a blueprint of the main performance indicators which were responsible for upholding Copa's sustained financial success. There is an opportunity for underperforming Latin American based airlines to benchmark the performance indicators of Copa Airlines against their own and to determine the range of deviances between themselves and Copa. The principle outperforming performance indicators of Copa Airlines consisted of the following factors: geographical positioning; cost leadership; unique low market concentration of competitors; a world class product; strong brand; punctuality; a high flight completion factor; a dollarized economy with strong GDP growth; longevity of the management team; an incentivised workforce; connectivity; airport attractiveness; market structure and convenience.

### 6.3. Recommendations for other Latin American carriers

Copa Airlines, equipped with favourable operating costs, has capitalised on becoming a super-connector by primarily connecting traffic between North and Central/South America that is reachable with narrowbodies by engineering a fine tuned operational hub based on its

geography – the foundations are well rooted for Copa Airlines to continue to prosper and become a ‘successful blueprint’ for medium sized Latin American carriers to replicate. A strong brand, punctuality, high flight completion factors, a low concentration of competitors, a world class product and cost leadership are all non-specific (i.e. those not related to local geo-economic indicators) factors found during Copa’s analysis that other Latin carriers can actively look to replicate.

#### 6.4. Limitations and future research

The limitations of the POA are numerous. Markets that are not deregulated will produce totally different findings to those that have open skies. 100% state owned airlines like Aerolineas Argentinas cannot be fully captured by the model as there is very limited public data available. The issues surrounding demand elasticities and passenger segmentation are also not properly captured. Carriers that are affiliated

to alliances have significant differences to non-aligned carriers and produce bias in the findings, while the impact from antitrust immunity and JVs are not considered. The continent overall faces significant impediments as about two-thirds of airline costs are demarcated by oligopolies or monopolies, which are largely government controlled entities, governed by strict labour regulations, impacting on results. The region is dependent on low-income markets with weak currencies, high inflation and steep taxes. It is difficult to validate the model for a region as large as Latin America; however for smaller individual countries such as Panama it becomes more attainable. The limitations of applying inputs from high level management into single case study analysis are the potential generalization and utility concerns that originate from such an endeavour – to this end it will be important for any future research to increase the number of Latin American cases, subject to an in-depth qualitative analysis so that the POA results can be further corroborated and substantiated.

**Table 3**

Annex. POA model data – performance ratios in 2016

INDEX	METRIC	LATAM	AVIANCA	GOL	AEROMEXICO	COPA	VOLARIS	AZUL
PROFITABILITY	Operating Margin	6.00%	6.30%	7.10%	6.60%	12.50%	11.70%	5.20%
OP. REVENUE	YIELD	6.93	8.59	7.01	9.85	7.49	4.13	9.22
OP. COST	CASK	0.066	0.082	0.058	0.088	0.055	0.050	0.083
	Fuel/ASK	15.24	16.66	17.85	16.17	14.91	10.34	20.45
CONNECTIVITY	Departure/hour	13.39	15.40	9.13	16.15	12.79	6.58	8.17
	N° Routes	655	450	545	255	171	272	593
	Codesharing Routes	398	151	85	190	198	0	28
	Waves at hub	5	4	0	6	6	0	0
CONVENIENCE	Frequencies/route	13.39	15.40	9.13	16.15	12.79	6.58	8.17
	Punctuality	81.85	80	86	71	88.4	75.4	89
	% business/route	0.02	0.08	0.00	0.08	0.10	0.00	0.01
	Airport Satisfaction	7	1	6	10	2	10	10
COMFORT	Customer Service	5.00	6.00	5.00	5.00	6.00	4.00	8.00
	Seat Width	31.61	33.38	31.00	32.61	31.30	31.00	32.20
	Seat Pitch	17.57	17.49	17.50	17.89	17.62	18.00	17.33
	Wi-fi	0	0	0	1	0	0	0
SALES AND DISTRIBUTION	% online bookings	26.40%	18.90%	80%	14.70%	19.20%	62.50%	87%
	Cost/passenger sales	11.16	18.50	5.23	23.39	11.74	1.85	4.02
AIRCRAFT PRODUCTIVITY	Average Utilisation Rate	10.04	10.30	11.20	11.20	10.60	12.80	10.10
	Aircraft sectors per day	7.71	4.94	5.93	4.73	3.38	4.89	5.80
	Aircraft Type Uniformity	0.46	0.37	1.00	0.40	0.85	0.83	0.60
	Aircraft Average age	7.00	5.70	8.00	8.40	7.20	4.20	4.80
LABOUR PRODUCTIVITY	Passenger /employee	1,349.48	1,399.74	2,137.67	793.68	974.24	3,294.91	1,999.81
	Employee /aircraft	155.55	124.62	126.12	84.052	87.42	66.00	83.15
	ASK/employee	2,720,087	2,238,497	3,035,777	3,065,000	4,054,391	5,901,844	2,217,922
AIRPORT ATTRACTIVENESS	Airport & en route charges/passenger	16.09	7.43	6.46	37.09	6.52	10.55	6.42
	% traffic at the hub	67.60%	65.40%	28.60%	45.00%	90.00%	55.00%	93%
	Annual passengers at hub (M)	17.70	27.70	43.50	38.84	13.255	4.98	10.74
MARKET STRUCTURE	% of monopolies	6.45%	26.46%	23.30%	19.52%	68.28%	31.62%	53%
	Operators per route	3.36	2.95	2.74	2.54	1.7	2.23	2.02
	Capacity Share/route	2.92%	2.60%	1.96%	1.91%	2.22%	1.47%	1.10%
ANCILLARY STRUCTURE	% of ancillaries’ revenues	5.65%	4.35%	12.11%	5.97%	4.01%	24.36%	13%
	Average revenue per passenger.	8.05	6.11	10.64	15.39	10.46	20.39	12.84
EXTERNAL FACTORS	Exchange Rate	0.00149	0.00033	0.29753	0.04872	1	0.04872	0.29753
	GDP per capita	19662.9	15365.5	15127.8	17861.60	23014.70	17861.60	15127.8
	Inflation Rate	3.50%	6.00%	6.30%	3.36%	0.80%	3.36%	6.30%
	Unemployment Rate	8.10%	10.00%	11.50%	4.00%	5.80%	4.00%	11.50%

**Table 4**  
Annex. Benchmark Ratios 2016

METRIC	BEST IN CLASS	LATAM	AVIANCA	GOL	AEROMEXICO	COPA	VOLARIS	AZUL
Operating Margin	MAX SCORE	0.11	0.15	0.26	0.19	1.00	0.89	0.00
YIELD	MAX SCORE	0.49	0.78	0.50	1.00	0.59	0.00	0.89
CASK	MIN SCORE	0.57	0.15	0.79	0.00	0.87	1.00	0.13
Fuel /ASK	MIN SCORE	0.52	0.38	0.26	0.42	0.55	1.00	0.00
Departure/hour	MAX SCORE	0.71	0.92	0.27	1.00	0.65	0.00	0.17
Nº Routes	MAX SCORE	1.00	0.58	0.77	0.17	0.00	0.21	0.87
Code sharing Routes	MAX SCORE	1.00	0.38	0.21	0.48	0.50	0.00	0.07
Waves at hub	MAX SCORE	0.83	0.67	0.00	1.00	1.00	0.00	0.00
Frequencies/ route	MAX SCORE	0.71	0.92	0.27	1.00	0.65	0.00	0.17
Punctuality	MAX SCORE	0.60	0.50	0.83	0.00	0.97	0.24	1.00
% business/route	MAX SCORE	0.20	0.80	0.00	0.80	1.00	0.00	0.10
Airport Satisfaction	MIN SCORE	0.33	1.00	0.44	0.00	0.89	0.00	0.00
Customer Service	MAX SCORE	0.25	0.50	0.25	0.25	0.50	0.00	1.00
Seat Width	MAX SCORE	0.26	1.00	0.00	0.67	0.13	0.00	0.50
Seat Pitch	MAX SCORE	0.36	0.24	0.26	0.83	0.43	1.00	0.00
Wi-fi	MAX SCORE	0.00	0.00	0.00	1.00	0.00	0.00	0.00
% online bookings	MAX SCORE	0.16	0.06	0.90	0.00	0.06	0.66	1.00
Cost/passenger sales	MIN SCORE	0.57	0.23	0.84	0.00	0.54	1.00	0.90
Average Utilisation Rate	MAX SCORE	0.00	0.09	0.42	0.42	0.20	1.00	0.02
Aircraft sectors per day	MAX SCORE	1.00	0.36	0.59	0.31	0.00	0.35	0.56
Aircraft Type Uniformity	MAX SCORE	0.14	0.00	1.00	0.05	0.76	0.73	0.36
Aircraft Average age	MIN SCORE	0.33	0.64	0.10	0.00	0.29	1.00	0.86
Passenger /employee	MAX SCORE	0.22	0.24	0.54	0.00	0.07	1.00	0.48
Employee /aircraft	MIN SCORE	0.00	0.35	0.33	0.80	0.76	1.00	0.81
ASK/employee	MAX SCORE	0.14	0.01	0.22	0.23	0.50	1.00	0.00
Airport & en route charges/ passenger	MIN SCORE	0.68	0.97	1.00	0.00	1.00	0.87	1.00
% traffic at the hub	MAX SCORE	0.61	0.57	0.00	0.25	0.95	0.41	1.00
Annual passengers at hub (M)	MIN SCORE	0.67	0.41	0.00	0.12	0.79	1.00	0.85
% of monopolies	MAX SCORE	0.00	0.32	0.27	0.21	1.00	0.41	0.76
Operators per route	MIN SCORE	0.00	0.25	0.37	0.49	1.00	0.68	0.81
Capacity Share/route	MAX SCORE	1.00	0.83	0.48	0.45	0.62	0.21	0.00
% of ancillaries' revenues	MAX SCORE	0.08	0.02	0.40	0.10	0.00	1.00	0.45
Average revenue per passenger.	MAX SCORE	0.14	0.00	0.32	0.65	0.30	1.00	0.47
Exchange Rate	MAX SCORE	0.00	0.00	0.30	0.05	1.00	0.05	0.30
GDP per capita	MAX SCORE	0.58	0.03	0.00	0.35	1.00	0.35	0.00
Inflation Rate	MIN SCORE	0.51	0.05	0.00	0.53	1.00	0.53	0.00
Unemployment Rate	MIN SCORE	0.45	0.20	0.00	1.00	0.76	1.00	0.00

Table 5

Annex. Final scores from the POA model results for 2016

	LATAM	AVIANCA	GOL	AEROMEXICO	COPA	VOLARIS	AZUL
OPERATING PROFITABILITY INDEX	1.096	1.507	2.603	1.918	10.000	8.904	0.000
OPERATING REVENUE STRUCTURE INDEX	4.908	7.808	5.040	10.000	5.888	0.000	8.903
OPERATING COST STRUCTURE	5.425	2.590	5.282	2.066	7.132	10.000	0.674
CONNECTIVITY INDEX	10.000	6.591	3.493	6.864	9.077	0.827	3.625
CONVENIENCE INDEX	5.320	9.402	3.900	6.195	10.000	0.576	3.272
COMFORT INDEX	4.362	8.833	2.707	10.000	5.643	4.440	8.611
SALES AND DISTRIBUTION STRUCTURE INDEX	4.551	1.796	9.245	0.000	3.989	9.428	10.000
AIRCRAFT PRODUCTIVITY INDEX	5.680	2.803	8.864	3.434	4.405	10.000	5.205
LABOUR PRODUCTIVITY INDEX	1.322	1.129	3.076	2.747	4.502	10.000	2.379
AIRPORT ATTRACTIVENESS INDEX	7.246	6.495	3.136	1.164	9.513	9.496	10.000
MARKET STRUCTURE INDEX	0.845	3.373	3.503	3.830	10.000	5.434	7.446
ANCILLARY STRUCTURE INDEX	1.130	0.070	3.508	4.192	1.779	10.000	4.639
EXTERNAL FACTORS INDEX	4.232	0.750	0.705	5.183	10.000	5.183	0.705

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