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Internationalization in the Airline Industry: econometric relations among  
business models, brand, alliances, and institutions

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*To Bonifácio, Leontina, Cláudia,  
Edson and all the friends made  
along the way.*



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## RESUMO

SCHNEIDER DE ALMEIDA, E. F. **Internacionalização na Indústria de Transporte Aéreo**: relações econométricas entre modelos de negócio, marca, alianças e instituições. 2020. 60f. Dissertação (Mestrado) – Escola de Engenharia de São Carlos, Universidade de São Paulo, São Carlos, 2020.

Empresas de transporte aéreo são caracterizadas por sua estrutura de redes (malhas aéreas) e expansão de mercado conectando diferentes sistemas econômicos, por exemplo, cidades e países. Por uma perspectiva da nova economia institucional – a qual fornece um abrangente arcabouço de análise de indústrias de rede – a internacionalização de empresas aéreas tem sido pouco explorada. Sob uma ótica quantitativa, esse texto visa um maior entendimento das relações existentes entre modelos de negócio, marca, alianças estratégicas e instituições, as quais podem impactar decisões de gestão na internacionalização de empresas aéreas. Escolhendo o compartilhamento de direitos de decisão em uma forma organizacional (membrosia em alianças de empresas aéreas) e de direitos de propriedade (licenciamento da marca) como critérios de internacionalização, um modelo econométrico foi desenvolvido para testar diferentes ambientes institucionais contra diferentes modos de operações de empresas aéreas. Algumas conclusões foram obtidas com respeito a como linhas aéreas estrategicamente desenvolvem seus processos de internacionalização. Olhando para algumas variáveis testadas, internacionalização da marca e participação em alianças estão negativamente correlacionadas nesse escopo de internacionalização, especialmente no caso das companhias *low cost*, guiando esse estudo para uma discussão sobre os modos de entrada escolhidos pelas empresas aéreas conforme a “abertura” institucional dada por cada país e a estratégia de utilização de recursos de cada empresa na amostra.

Palavras-chave: Indústria do Transporte Aéreo. Internacionalização. Ambiente Institucional. Direitos de Decisão. Direitos de Propriedade.



## ABSTRACT

SCHNEIDER DE ALMEIDA, E. F. **Internationalization in the Airline Industry:** econometric relations among business models, brand, alliances, and institutions. 2020. 60 p. Dissertation (Master of Science) – Escola de Engenharia de São Carlos, Universidade de São Paulo, São Carlos, 2020.

Air transport firms are characterized by their network nature and market expansion through connecting different economic locations, e.g. cities and countries. From a new institutional economics perspective - which provides a comprehensive framework in analyzing network infrastructures such as air transport industry - airline internationalization phenomena have been little explored. Through a quantitative investigation, this text seeks a broader understanding of existent relations among business models, brand, strategic alliances and institutions that may impact management decisions on airline internationalization. By choosing decision rights sharing via an organizational form (membership in airline alliance) and a property right (brand licensing) as internationalization criteria, an econometric model has been developed to account for different institutional environments against different airline modes of operation. Some conclusions were drawn about how companies strategically develop their internationalization process. Regarding special test variables, brand internationalization and alliance membership are negatively correlated within this internationalization scope, especially in the case of low cost carriers, steering to a discussion about modes of entry chosen by carriers according to the institutional “openness” given by countries and strategies of resources allocation of each airline sampled.

Keywords: Air Transport Industry. Internationalization. Institutional Environment. Decision Rights. Property Rights.



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## LIST OF ABBREVIATIONS AND ACRONYMS

ATI	–	Air Transport Industry
FSC	–	Full Service Carrier
GAID	–	Global Airlines International Database
IATA	–	International Air Transport Association
ICAO	–	International Civil Aviation Organization
IMF	–	International Monetary Fund
LCC	–	Low Cost Carrier
UN	–	United Nations
UNCTAD	–	United Nations Conference on Trade and Development
WTO	–	World Trade Organization



## LIST OF SYMBOLS

$E(x)$  Expected value of random variable  $x$

$E(y|x)$  Expected value of random variable  $y$  conditional to variable  $x$

$f^{-1}(x)$  Inverse function of function  $f(x)$

$A$  Vector  $A$

$e$  Euler's number

$Y \sim B(m, p)$  Random variable  $Y$  has a Binomial Distribution with parameters  $m$  and  $p$

$\binom{n}{p}$  Binomial Coefficient

$\ln(x)$  Natural Logarithm of  $x$



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## 1 INTRODUCTION

Motivations that lead a firm to expand operations to regions other than its home country in addition to strategies employed on respective internationalization processes have been studied across several industries since globalization has taken place in the world economic system. This is the case in Dunning and Lundan (2008, chap. 3) regarding the internationalization determinants and in Besanko (2013, chap. 2 e 3) with respect to a framework for corporate strategy which can be well related to international business process as well. How a firm produces or delivers its services, in other words, the way through which production process is organized, is steered by strategy which, in turn, reflects economic fluctuations across domestic and international operational environments. Decision making process, given an economic scenario, is a constant adaption phenomenon (WILLIAMSON, 1991, 1993) and market expansion could be seen as an alternative for sustained competitive advantage. Hence, mechanisms through which a company grows domestically and internationally can be first-hand explored by analyzing some economic indicators.

### 1.1 Historical Contextualization of Firms Internationalization

From a historical perspective, internationalization of companies has its origin on trade activities and such trading can be traced back not only between geographically close societies, but among established and distant nations that obtained significant part of their economic development from it. In the context of globalization, especially in the post-World War II period, an emergence of peace fostering and global trade organizations, i.e., UNCTAD and WTO enabled trade activities between nations increasingly. With the consolidation of the manufacturing industry and the need for an international expansion of production by industrialized countries, the regulatory environment began to be evidenced and has been providing an institutional basis for the international development of companies since then.

Generally speaking, coordination of institutional and economic settings has been attributed to global regulatory authorities. First, this basis came in 1947 through the General Agreement on Tariffs and Trade (GATT), what would later become the World Trade Organization (WTO). Throughout the decades, this international trade regulatory soil gained even more seeds with the emergence of the services industry, which has been accompanied mainly by advances in telecommunications and information technologies. The younger

General Agreement on Trade in Services (GATS) has brought new rules for the services industry from 1995 onwards. It is worth noting that, though consolidated as an important element of international trade more recently, the service sector follows, and sometimes depends on, the growth of much more mature transactions such those of the manufacturing sector: according to WTO International Trade and Tariff Data (WTO, 2018), although being more than 200 times (9.1 trillion dollars against 41 billion dollars market) larger in average, for the last 30 years or so, average yearly growth rate for goods and services are sort of the same magnitude, goods exported by countries have increased by 8.3% whereas services exported changed by 7.9%. On the other hand, service sector might play a key role for manufacturing firms. Dealing specifically with services internationalization, Vandermerwe and Chadwick (1989) studied ways in which companies from various industries could enter foreign markets, under their various forms of value creation through a framework that reaffirms the importance of product-service interaction in different economic locations.

## 1.2 Air Transport Industry Economic Characteristics

Characterized by its intangible assets delivery - a means of transportation for passengers looking to reach another location - air transport services industry gathers a myriad of specific economic characteristics on regulatory, strategic and competition spheres to name a few. Industry size and relevance can provide a first notion of these aspects. In 2016, for example, the number of unique city-pair connections exceeded 18 400, which is over 700 more than in 2015 (DE JUNIAC, 2017). Air transport industry was exposed to increasing degrees of economic liberalization, what means that economic regulation applied to this industry evolves. These easing measures were first conducted at national levels, with the U.S. Airline Deregulation Act from 1978 being the first and most notable one. In the Brazilian regulatory sphere, this evolution has become more legit through the establishment of the National Civil Aviation Agency (ANAC) in 2005. From that, an indicated openness of the market has stimulated interest on foreign air transport companies to come and go in Brazilian skies in a more consolidated manner as it was the case for the Colombian brand Avianca Airlines.

Following these national efforts, regional efforts, then, came to existence. To illustrate, one can enumerate the setting up of the European single air transport market in Europe, as well as the South American agreement enforced by the *Acordo de Fortaleza*. Finally, a number of agreements relating countries from different regions emerged. Air

Service Agreements that grant varying levels and directions of transactions, in which signatory countries commit, sometimes bilaterally, and, in other circumstances, multilaterally. The bilateral Brazil - U.S.A. air service agreement and the multilateral agreement among the European Union and the United States exemplifies these kinds of transactions.

In respect to the strategic sphere, the airline industry, in general, and its international operations in particular, have also been subject to powerful external shocks from macroeconomic nature that compel firms to adapt and operate under new strategic paths. As an example, oil price shocks can be located throughout the years, sometimes originating in production policies put forth by OPEC, sometimes caused by wars, sometimes simply due to demand and supply mismatch. Either way, impacts of oil price variations on cost structure of airlines is pivotal. According to Barsky and Kilian (2004), the 1999 OPEC Meeting and its following decisions to increase oil prices, what might be viewed as a precedent to US 2001 recession, brought about consequent changes in input prices to air carriers. Such events place needs for adaptation within the industry at a global level, as in the case of airlines fuel hedging (MORRELL; SWAN, 2006).

International transactions in the ATI are enabled by air service agreements, as already mentioned, apart from exceptional regulatory settings provided by international authorities such as ICAO or WTO. It can be understood that with these new patterns of regulation provided by “organizations” such as ANAC, especially in emergent economies, air transport companies are expected to start and propose new modes of international operation as it was the case for airline franchises (DENTON; DENNIS, 2000) and airline alliances (FAN et al., 2001) in the beginning of the century.

Regarding the competitive environment, what may be observed in present times is a predominantly oligopolistic structure for domestic air transport markets. However, when approaching the international arena, airlines have developed complex strategic, operational and financial arrangements and consequent economic transactions. Motives for these settings could be in part analyzed by looking to each country intrinsically. Several illustrations about these international market expansions can be derived round the globe. Virgin Group Inc. (a British conglomerate), for example, had until recently, brand internationalization as a market expansion strategy under its subsidiaries: Virgin Australia serving passengers in Oceania and Asia, Virgin Atlantic in Europe and also Virgin America, which operated regional routes in North America. Moving south to Latin America, a not long time ago merge which gave origin to a new brand, namely LATAM, could also be observed as an internationalization strategy for both Chilean airline LAN and the Brazilian carrier TAM. Nowadays, this airline group has

a series of brand relations among its affiliate companies in almost all Latin American countries and for both passenger and freight transport.

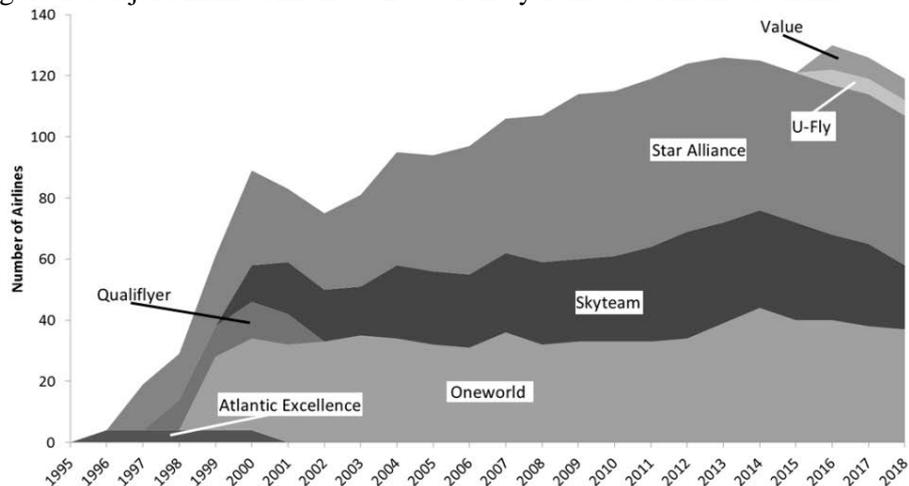
### 1.3 Research Problem

Given all these economic aspects of the internationalization process and, more into detail, how different airlines internationalize its operations, what is to be pointed hereinafter deals with airline business models choices, strategic modes for internationalization and how institutions permeate and affect the whole air transport industry. Several literature contributions can be found with respect to each of these broad concepts and a review is presented in the following section.

Investigation on the relation of national and international spheres (so to say markets) in the industry of air transport is not of any novelty. In fact, this existent national/international dichotomy inherent to airlines is led up to the institutional level, such as the regulatory environment and operational rules to be elaborated for each one of these “markets”.

Notwithstanding, this analysis looks at another side of the internationalization process of the airline industry. Since mid-1990’s, two forms of organization appeared in the domain of the airline markets as means for promoting varying levels of internationalization: one could witness (i) the birth of major airline alliances (Figure 1) and (ii) the resurgence of cases involving the use of foreign brands giving name to local airlines (Figure 2). This study puts under spotlight these different strategic and firms resources allocation issues. Airline Alliances can be seen as a form of cooperation between two or more airline companies aiming to enhance competitiveness and performance of its members (GAGGERO; BARTOLINI, 2012).

Figure 1- Major Airline Alliances Evolution by number of member airlines

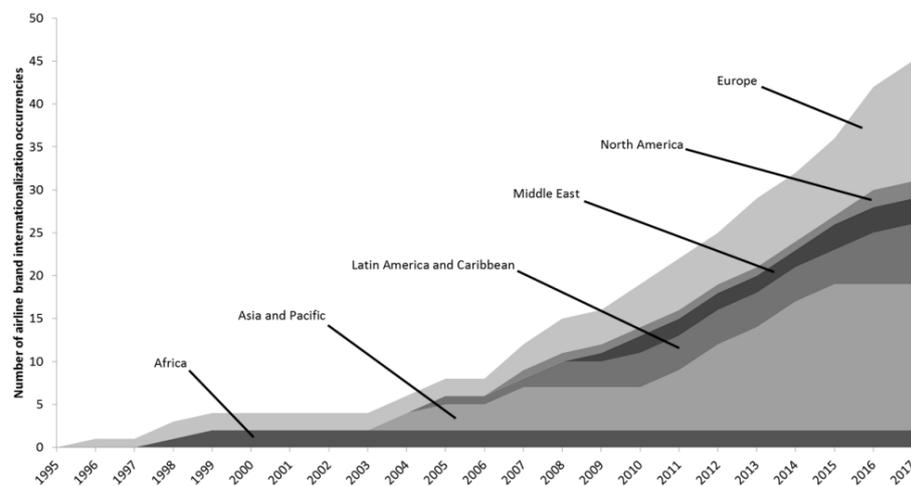


Source: The author with data from Calzaretta, Eilat and Israel (2017); CAPA (2018).

As shown in figure 1, throughout time, three main airline alliances emerged. These three organizations do have an operational and financial structure themselves dealing mainly with coordination of operations and promoting joint interest of its members. Airlines pertaining to an alliance often share and reduce transaction costs in sales, operations, systems, facilities and also staff. To participate in airline alliance is a process, and this strategic decision has to be taken thoroughly both by the airline and also by the alliance board. Given these facts, one can say that internationalize by entering an airline alliance is more of a static/long term than a dynamic/short term issue. Together, Star Alliance, Oneworld and Skyteam encompass fifty-nine member airlines in a global 600 billion dollar, in terms of revenue, business.

On the other hand, brands are more intrinsically related to the airline itself. For example, in airline services, passengers may feel strongly that their current purchases are right for them and that their chosen airline service is the best, and rarely change their decisions (COYLES; GOKEY, 2005). Airlines that choose this strategy of internationalization are, in a certain level, concerned to its core values and specific competitive advantages.

Figure 2 - Airline Brand Internationalization Evolution by number of brands licensed in other countries



Source: The author with data from CAPA.

Academic research on the first of the organizational forms (alliances) is vast, reflecting the fact that it constitutes one of the most established faces of contemporary airline competition: indeed, perception and concrete evidence about the weight of airline alliances is sophomore. Airline alliances are understood to impact decisions and variables as distinct as pricing, scheduling, merger and entry deterrence in the airline industry, as Bowen (2002),

Clougherty (2000), Hsu and Shih (2008), Park and Zhang (2000), Serednski, Steitz and Rothlauf (2017), Youssef and Hansen (1994), Zou, Yu and Dresner (2012) show.

However, reality for the second form we consider here (brand) is distinct: according to our best knowledge, very few studies mapped the choices and impacts of airline brand internationalization. This is a statement made by Klein et al. (2015, p. 17):

[...] little attention has been paid to the modes, drivers, and success of airlines' internationalization strategies. It is only recently that studies have offered insights into the drivers of airlines' foreign market entry and, in doing so, have dealt with the question of why (process) and where (location) airlines internationalize to [...] Apart from the fundamental strategic decisions of why and where, internationalization can also be assessed from the perspective of how airlines internationalize; that is, which modes of internationalization they choose. [...]

To some extent, this is a bit of a paradox, as brand itself is considered to be one of the most valuable assets one airline has, and also one of the main firm characteristics consumers assess in advance to a ticket purchase, as shows Jeng (2016). What connections, then, from an economic perspective could be traced for airline internationalization? Are air service agreements a way to institutionally promote the emergence of hybrid organizations, as defined by Ménard (2012)? How to approach the ownership versus control problem when licensing brand? Or more into depth, how property and decision rights are related to the internationalization process?

This study may then find reasons for its development by addressing an industry which is of great impact to world economy carrying more than 1.8 billion international passengers yearly and transporting 35% of world trade shipments in value: Air Transport enables a network infrastructure of goods and services that are essential for society in various ways, and - through this international integration - economic development is also achieved (BUTTON; TAYLOR, 2000).

Given the different forms of organizations and resources existent in airline industry, through a quantitative investigation, this text seeks the objective of identify relations among business models, brand, strategic alliances and institutions that may impact management decisions on airline internationalization. As a hypothesis, considering the decision and property rights allocation issues related to the internationalization process, specially taking

airline alliances and brands as subjects, focus is given on investigating how this process occurs.

#### 1.4 Text Structure

This text is organized as follows: next Section presents a contextualization of the literature that addresses the area of knowledge herein treated, bringing the general perspectives on the internationalization of companies and prompting the discussion to the context of the air transport industry (from now on, also mentioned as ATI). Methodology used is addressed in Section 3. Results are presented in Section 4 jointly to a discussion about the analysis developed. The last section concludes.

## 2 LITERATURE REVIEW

### 2.1 Internationalization of Production

Internationalization of companies can be analyzed considering its origin in manufacturing sectors of industry. Along years of consolidation as a research field, it has been accompanied by theoretical definitions, with economic, behavioral and strategic approaches - see Aharoni and Brock (2010) and Dunning and Lundan (2008) for a factual and chronological overview. Concepts of corporate operating structures such as multinational, global and transnational (BARTLETT, 1986), as well as models trying to describe mechanisms of internationalization of these companies, i.e., the eclectic paradigm, or OLI model (DUNNING, 2001), constitute bases for this field of knowledge.

On the internationalization of services study field, it is understood that the literature has theoretical contributions mainly originating from manufacturing sectors (producer of goods) as in Erramilli and Rao (1993) and in Groenroos (1999). In fact, there are discussions about which types of services are capable of being internationalized and, moreover, attention is given to institutions and their influence on business issues, consequently, how institutional environments can impact the internationalization of services (MEYER et al., 2009; PENG, WANG, and JIANG, 2008). Furthermore, there is also an increasing dialogue about emerging markets and their insertion in the context of international business: cultural, institutional, geographic, economic, apart from psychic distancing among societies are investigated jointly to their influences to market dynamics, modes of entry, operational efficiency and knowledge management of companies competing in the international arena (HUTZSCHENREUTER, KLEINDIENST and LANGE, 2015).

### 2.2 Internationalization in Airline Industry

Characterized as one of the most global of all industries (HANLON, 2007), the aviation segment is closely followed by institutional and regulatory aspects in all markets upon which airlines do operate. Starting with the Chicago Convention in 1944, the regulatory setting for international air transport has been delineated. A very particular trait of this industry is the existence of a United Nations (UN) agency entirely dedicated to the international regulation of its services, i.e., International Civil Aviation Organization (ICAO). ATI presents notable characteristics such as its bifurcation between national (domestic) and

international markets – which is the subject of this work - (J. A. Clougherty, 2001). This segmentation translates into a key aspect to understand the intrinsic regulations of each one of these markets: at the national level, with a greater autonomy; and international, with less flexibility for airlines.

Which and how theoretical underpinnings can be adopted for firm internationalization in the context of ATI has been found in the literature for at least the past three decades. Departing with ideas from the field of services, such as in Vandermerwe & Chadwick, (1989), Erramilli & Rao (1993) and Groenroos (1999).

When one focus on airlines, there have been attempts to describe airline companies internationalization strategies according to the existing literature on the one hand (RAMÓN-RODRÍGUEZ; MORENO-IZQUIERDO; PERLES-RIBES, 2011). On the other hand, possible arrangements for these internationalization processes have been proposed by (ALBERS; HEUERMAN; KOCH, 2010) and also by Walulik (2016) which is specially related to institutional economics and, more precisely, approaches a legal discussion about restrictions on foreign penetration in aviation markets on a global comparison. Interestingly, as the study of 121 local regulations shows, there appears to be no important correlation between the general stage of national economic development or political liberty and the airline ownership and control regime. This indicates that the drivers of liberal and restrictive tendencies in airline investment laws should be searched for among sector-specific factors such as transport geography, competitiveness of local airline industry and its significance for tourist traffic or national security. Despite of Walulik's findings, an econometric analysis, which was not developed in his study, is to be presented here in order to assess these evidences within another level of quantitative analysis and using data related to macroeconomic and sectorial factors.

### 2.2.1 Other Theoretical Perspectives

Notwithstanding the discussion that has been developed so far, it is valid to point out some theoretical perspectives that do not constrain the discussion concerning airline internationalization within economics or international business.

- i. Financial Internationalization: related to exploration and exploitation of ways to obtain international financial resources supporting the usual operations (working capital), extraordinary operations (expansion plans and fleet plans) or the constitution (issuance of shares) of an airline (JEAN; LOHMANN, 2016; LIN, 2012; SCHERAGA, 2004);

ii. Internationalization of Resources: non-financial resources of the company (hereinafter referred to as "Resources") which are subject to internationalization. They refer to regular contracting of assets abroad. The most trivial cases are, for example, acquisition of aircraft (aircraft industry is extremely concentrated and few countries have aircraft manufacturing companies) and fuel purchasing for returning flights (considering a regulatory setting that permits it). There are also more complex cases, i.e., hiring of foreign pilots (human resources) and aircraft leasing. These are more sophisticated examples of international relationships. Moreover, this topic can be derived from the resource-based view theory - RBV (PENROSE, 1959; WERNERFELT, 1984; BARNEY, 1991);

iii. Internationalization through Foreign Direct Investment (FDI): to illustrate, subsidiaries. This is related to overseas controlling of companies by a determined airline. This also refers to special situations, generally linked to the "Freedoms of Air" or to local regulatory frameworks that impose limits on the exploration and exploitation of economic activities by foreign companies. When access to local operations (domestic flights) is not possible, or when diplomatic disputes lead to very particular situations (e.g. some Chinese government policies), airlines are faced with the need to establish local subsidiaries (EasyJet Switzerland, for example), or to create specific brands (KLM Asia) in order to service a particular market. Yet, it has been extensively observed by international business authors that foreign direct investment (FDI), cooperation and export (DUNNING, 1981) are the most important mechanisms for internationalization because of their leverage over ownership which is also related to governance structure (ALBERS; HEUERMANN; KOCH, 2010);

iv. Administrative support internationalization: what translates into the internationalization of entities that make up industry's value chain, a reference to this analysis is found in (RUGMAN; VERBEKE; YUAN, 2010, p. 257), when adapting the work of Porter (1985). This approach deals with commonly known outsourcing activities that do not constitute core businesses. Very common cases in air transport involve the provision of customer support telephone services (call centers) and aircraft maintenance services abroad. Examples of these cases include American Airlines' call center in India, responsible for meeting the needs of the company throughout Asia-Pacific region, and the existence of large service providers of maintenance, repair and overhaul (MRO) in China and Singapore which have among their customers, for example, US based companies.

### 2.3 Hybrid Forms of Organization

To present date, new institutional economics, which has evolved from institutional economics and its understanding that institutions do matter in economics, as condensed by Ménard and Shirley (2005) - and also later advanced in terms of future perspectives, as in Ménard and Shirley (2014) - has in its core three main concepts, what is by them called a “Golden Traingle”. In this framework, *Transaction Costs*, *Contracts* and *Property Rights* interconnect in practically all economic systems from an institutional point of view. This particular text attempts to investigate the phenomenon of airline internationalization under a different perspective, focusing more on the allocation of property and decision rights pillar of the triangle.

Digging deeper on theoretical issues, some definitions and considerations about properties and decision rights as in Baker et al. (2008) are also relevant to the analysis of internationalization, other than Foreign Direct Investments (FDI) – as the authors develop:

[...]but also because our discussions with practitioners and our reading of the empirical literature suggest that contracts that allocate decision rights across organizational boundaries are a common feature of strategic alliances.

Starting from most common terms in New Institutional Economics (NIE) vocabulary, *transaction cost theory* found a place in airline studies and its use can be pulled back up to the first decades of the 1900s, as Jones and Pustay (1988) show how the magnitude of *transaction costs* can explain firm competition and cooperation decisions range. Similarly, Rieple and Helm (2008) show how *asset specificity* can be a limiting factor in outsourcing decisions in the airline industry. Teng and Das (2008) deal with the governance structure in alliances in general, also encompassing airlines, and investigate how the type of *strategic alliance* determines internal organization. Kole and Lehn (1997) investigate how firms react to economic environment shock, and how *path-dependent* their *hierarchies* are in such a process. Oum, Yu and Zhang (2001) show how airline alliances can provide a *de facto* change to *formal institutions*, i.e., government regulation, bypassing antitrust *enforcement* authorities. Forbes and Lederman (2009) investigate how the decision on the level of *vertical integration* (from partnership to ownership) depends on ex-post contractual renegotiation costs.

Vespermann and Wald (2011) show how an efficient system of *property rights* allocation will be crucial for the environmental targets of the airline industry.

The term “hybrid form” is due to Oliver. E. Williamson (WILLIAMSON, 1975) and expresses a situation in which neither hierarchy (firm) nor simple, immediate spot market is in use. To illustrate as governance costs increase, companies may benefit by interacting with others in mutual transactions that not only diminish costs of transactions previously in use but also creates a new organizational arrangement thus called hybrid.

### 2.3.1 Hybrid Forms of Organization in the Airline Industry

As one of the themes most prominently researched in the last decade, airline alliances should receive a dedicated explanation in this text, a first issue that apparently came to sight is a preoccupation in understanding impacts that the formation of alliances may bring on fares and market concentration (YOUSSEF; HANSEN, 1994). Afterwards, some authors had begun to investigate plurality on, at that time, the emergent alliance formation phenomenon among airlines. Park; Zhang, A. and Zhang, Y. (2001) analyzed cooperation and competition between companies and the subsequent deployments in different forms of alliances. Increasing internationalization potential of domestic firms through the establishment of a strategic alliance involving them was the object of analysis of Clougherty (2000). Institutional aspects encompassing alliances, more specifically, explaining determinants of their formation was one of the objectives of Bowen (2002). Connectivity and integration of carriers’ networks in regards to the creation of alliances (HSU; SHIH, 2008) and an analysis under total utilization of the global connectivity potential existent among their members has been recently studied by Seredynski, Steitz and Rothlauf (2017). An assessment of companies’ profitability when entering airline alliances and a further comparison to that of respective alliance founding firms was addressed by Douglas and Tan (2017). Multimarket relations and prices dynamism impacts on airlines which pertain to an alliance (ZOU; YU; DRESNER, 2012) have been also explored in this last group of studies.

Another hybrid form with some extent in the airline industry is the internationalization of brands, something less common but of interest in this research. Several illustrations about these international market expansions can be derived round the globe. Virgin Group Inc. (a British conglomerate), for example, had until recently, brand internationalization as a market expansion strategy under its subsidiaries: Virgin Australia serving passengers in Oceania and

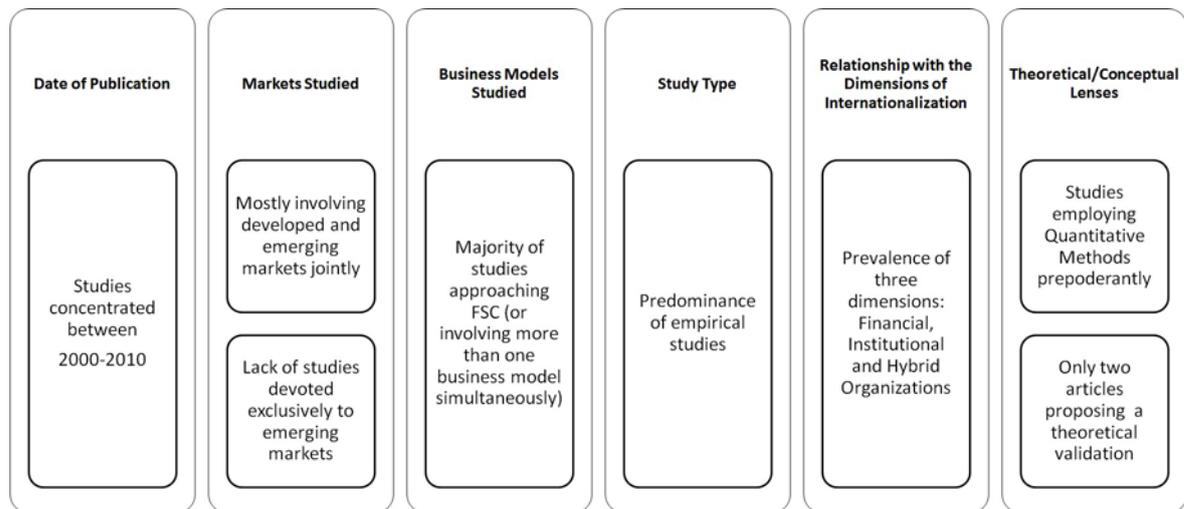
Asia, Virgin Atlantic in Europe and also Virgin America, which operated regional routes in North America. Moving south to Latin America, a not long time ago merge which gave origin to a new brand, namely LATAM, could be also observed as an internationalization strategy for both Chilean airline LAN and the Brazilian carrier TAM. Nowadays, this airline group has a series of brand relations among its affiliate companies in almost all Latin American countries and for both passenger and freight air transport. When we look at low-cost carriers, this phenomenon seems more intense because of the profusion of local brands Air Asia and JetStar groups concentrate in Asia.

However, it is worth mentioning is that academic literature is a lot scarcer in regards to this subject. Indeed, apart from Ainscough (2005) and Chung and Feng (2016), very few other papers we are aware of have dealt with this modality of hybrid form, Denton and Dennis (2000) being one vivid exception.

#### 2.4 Research Gaps and Directions

From the studies related to internationalization within ATI, three dimensions, in special, could better explain trends observed in the research field. These are financial, institutional and hybrid forms of organization. Prevalence of these three specific dimensions can be understood by high levels of investment required, strong regulatory environment and state intervention, as well as the adaptive dynamism faced by companies pertaining to ATI. All these characteristics of airlines operating environment produced mechanisms for accessing new markets. Primarily through the formation of strategic groups between companies (THOMAS; VENKATRAMAN, 1988) and then through international airline alliances phenomenon, which, as Ménard (2004) described, are hybrid forms of organization. Encompassing main trends obtained in this literature review, Figure 3 provides an outline.

Figure 3 - Trends observed in the internationalization of airlines literature



Source: the author

In order to organize and summarize main points of this literature review, as well as highlighting internationalization in the airline industry topic, at least two distinctive industrial features benefit from discussions rooted on NIE:

1. There are a significant number of legal aspects that either bound or allow actions by firms; industry exhibits high degree of both economic and technical regulation, and *these vary widely by country*, what exposes airlines with international exhibition to a scenario of increased complexity;
2. The appearance of a net of contracts is a very distinctive and distinguishable feature. In the typical "buy or do" continuum, airlines constantly weight aspects such as public image, fidelity and costs of different types (anticipated, non-anticipated; production, transaction; etc.). If by one side the capital intensiveness may discourage investments, by the other side asset specificity calls for more control, more hierarchy.

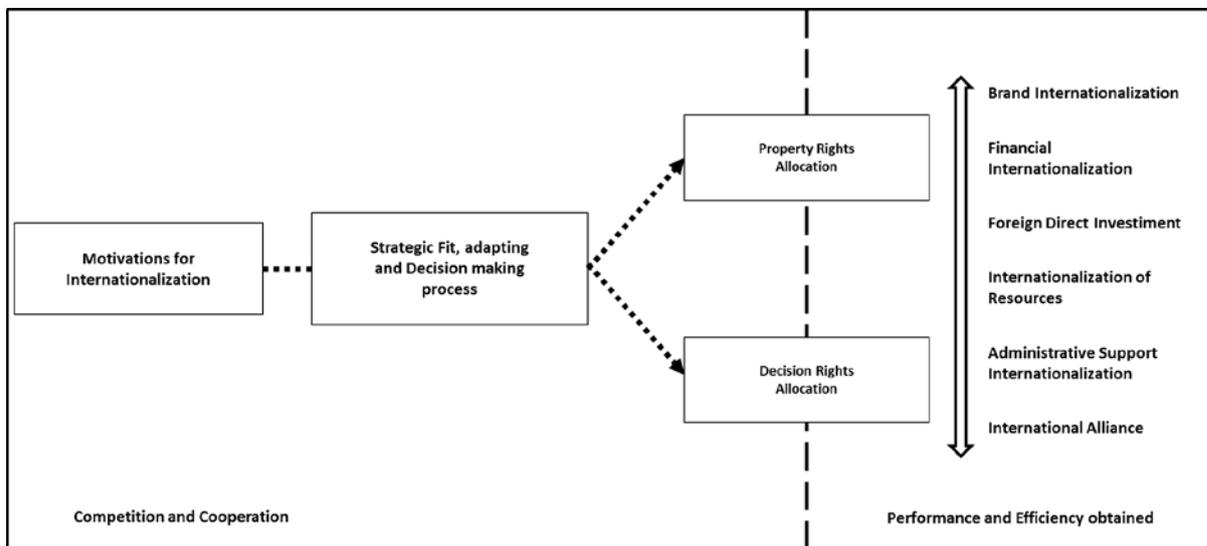
In this sense, a wide selection of concepts originally developed (or traditionally linked to) by NIE can easily find application in this industry, and in the internationalization efforts in particular, especially when internationalization means an expansion of firms to new institutional environments upon different corporate operating structures (NORTH, 1987)

### 2.4.1 Research Approach

After identifying motivations for internationalization, for instance, sustained competitive advantage, managers assess competitive environment of the foreign market to be explored and given the complex regulatory (institutional environment), often strategic cooperation among firms is established. In finding a strategic fit, companies, then, adapt their operations to this new “hybrid form” of organizational setting where a company now has part of its revenue streams coming from abroad by having some sort of relation (e.g. strategic partnerships, joint ventures, subsidiaries or franchises) with another foreign company abroad. This is achieved mainly through contractual governance (NIELSEN, 2010).

Finally, the term *governance* is one of the main concepts through which international cooperation of economic entities occurs and depending on the structure adopted for it, e.g. an airline alliance or brand concession, different outcomes in performance and efficiency are obtained, as it has already been addressed by some studies (ABDULLAH; MUNISAMY; SATAR, 2013; BACKX; CARNEY; GEDAJLOVIC, 2002; MORELL, 2005).

Figure 4 - Schema for introducing hypothesis and model to be tested



Nonetheless, existing studies do not yet harmonize on the existing theories and models for internationalization considering the characteristics of ATI. The institutional environment of each global region presents itself as a relevant factor for the (non-) favorability for a foreign company operation in a host country. Thus, internationalization strategies adopted by airlines also need to incorporate such restrictions from the operating environment in order to

reduce uncertainties (WALULIK, 2016). Moreover, quantitative approaches, although present in the literature, do not often combine different business models and strategies on a global scale. One can, then, say that given such characteristics, the air transport industry is inherently international and by taking a closer look to its main internationalization aspects empirically might add to current mainly theoretical studies. As an illustration and recalling this work hypothesis, figure 4 summarizes main concepts delineated so far upon a framework that also situates the model to be tested in this research.

### 3 DATA AND METHOD

#### 3.1 Model Hypotheses

Hypotheses dealt within the econometric model are related to the economic effects interrelated in the process of airlines internationalization. Few studies have explored the impact of institutional environments on the decision regarding foreign companies' modes of entry in a country. Some examples come from emerging markets as pointed by the institution-based view of international business strategy (MEYER et al., 2009; PENG; WANG; JIANG, 2008). What about different structures in institutional settings and the further correspondent governance chosen by incumbent firms? Three main levels of analysis are delineated in order to account for this question: macroeconomic, regulatory and competition variables which may affect the decision of airlines to belong to an alliance.

#### 3.2 Variable Construction

Chosen variables are related to what can be intrinsically related to companies' rights allocation process under an internationalization setting. Within a regulatory framework, IATA membership and low cost carrier strategy can prone some major paths of internationalization for airlines. On the competitive side, carriers time of operation and ownership structures, i.e. state or private, can also influence the industry environment and dictate specifically how the internationalization process occur. Another aspect which plays an important role on rights decision is credit in order to invest on foreign ventures. Although difficulties on measuring such vast dimensions of economic institutions have been pointed (VOIGT, 2013), and even

how to properly specify them within an economic quantitative framework (SEARLE, 2005), here it is believed that an aggregate index on a macroeconomic level, such as the depth of credit information index, could at least provide a direction on how institutions affect the internationalization of airlines. Depth of credit information index measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions (WORLD BANK, 2018). Lastly, on the macroeconomic level, GDP yearly growth and the economic development status of countries in which the airlines operate were considered.

If one is to ascertain about sign relationships among these variables, a preliminary consideration has to be made regarding one of the first variables of interest, that is, brand. Whether an airline chooses an internationalization strategy through brand expansion or via participation in an alliance lies at the core hypothesis of this work. Hence, it is expected that by resources allocation issues and strategic decisions, a company, more specifically, an airline, which has to be efficient in both, develops its internationalization by either one of these forms. This leads us to expect a negative parameter for the brand variable.

### 3.3 Database Construction

Data gathering constitutes the first step onto this research, all processes along this method were employed in order to ensure traceability and reproducibility, provided that, besides analyses herein proposed and discussed, additional studies can benefit from a global airlines internationalization database which was elaborated in this research. For brevity, whenever this database is to be mentioned the acronym GAID will also be used. This database was created using computational programming environment R (R CORE TEAM, 2017) and stems from a range of public available data on accredited sources relating to both global economy and ATI. As a sequential process, the following lists stages of GAID construction:

- Searching available data sources, three main platforms were obtained, namely, ICAO (UN) and CAPA (Centre for Aviation) related to air transport and World Bank Group, International Monetary Fund, and United Nations (UN) dedicated to global economy. Information was then listed, organized and categorized according to sectorial and macroeconomic variables.

- Elaborating a relational database using R programming. The aim of the relational database is to enable several different analyses concerning airline internationalization, primarily, an econometric model concerning internationalization dimensions described in this text. For example, establishment of intersections between sets of data not to mention descriptive statistics are easily obtained after completion of data input. At this stage, estimation of missing data and adequacy for analysis is also achieved.
- At last, cross section can be derived from GAID in order to perform econometric analysis and statistical testing.

From a global perspective, results from database can be assessed by grouping information according to world regions, as shown in figure 5. In total, information from 192 air transport companies could be gathered mainly through CAPA – Centre for Aviation (2018) and airlines corporate websites. Carriers were classified according to their business model, namely, Full Service Carriers and Low Cost Carriers. The summary provided in the figure also places a notion on activity status of each airline around the globe: according to data all sampled companies were still operating in 2018. This information can also state the representativeness of the created database in comparison to commercial airlines that currently operate globally. Additionally, Figure 6 shows data sampled considering airlines which have an international brand and their place of operation.

Figure 5 – Global distribution of airlines pertaining to alliances in the sample

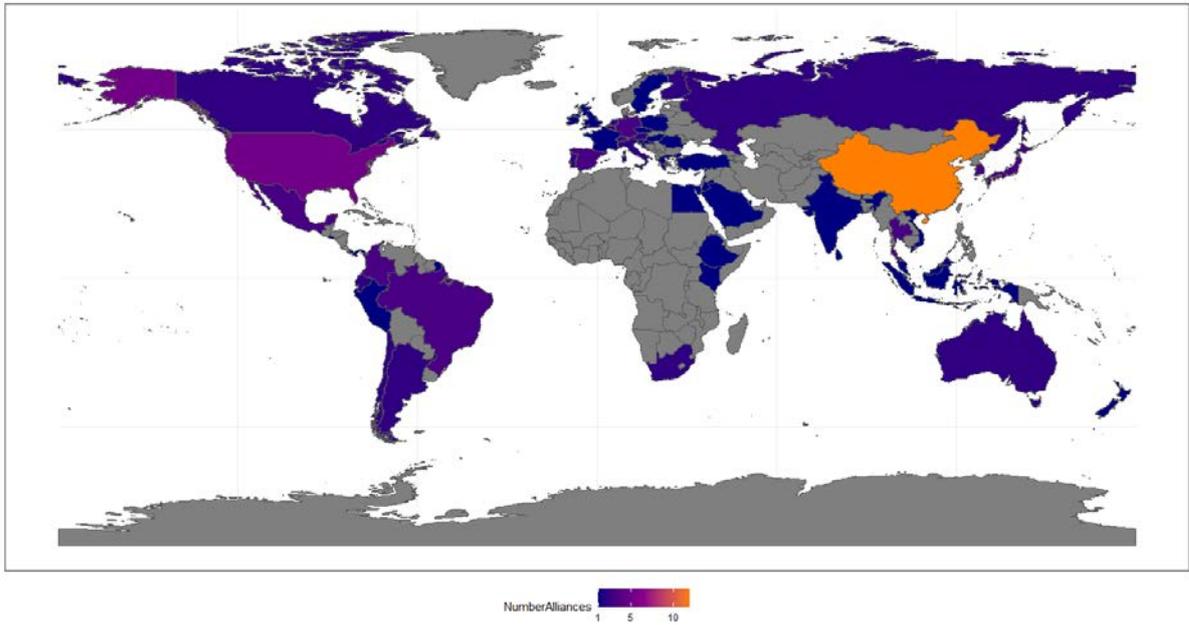
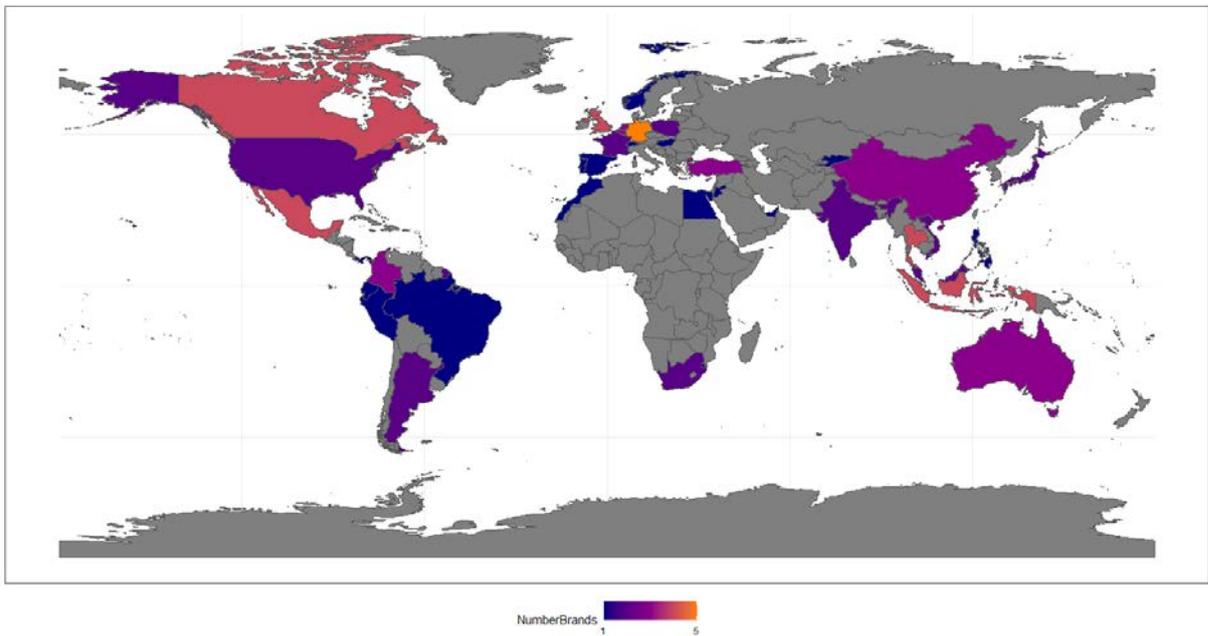


Figure 6 - Global distribution of airlines which internationalized brand in the sample



Considering the pronounced difficulty in finding open and public data on airlines internationalization, more precisely, organized data on the subject. This work can find its first contribution by creating a dataset that enables initial econometric analyses. Furthermore, previous studies have considered mainly small sample sizes and given the changes that air transport industry has been through since the 2000s, with a more recent timeframe, this study aims to add on the investigation on internationalization of service companies quantitatively.

Table 1 summarizes main descriptive statistics for the sample derived from GAID comprised by the 192 airlines which belong to 79 different countries in a cross section for the year 2016 (most up to date data available considering a business model categorization from ICAO).

Table 1 – Descriptive statistics on the airlines sampled for the study

Variables	Description	N	Proportion (Yes/No values)	Mean	Std Dev	Min	Max	Data Source
AllianceMember	Whether the considered airline (i) is a member of an alliance (1 for Yes and 0 for False)	192		0.458				Calzaretta et al. (2017), CAPA and Companies' Websites
FDIperGDP	Foreign direct investment, net inflows as percentage of GDP	192		4.82%	10%	-7.33%	76.53%	World Bank Data
GDPGrowth	Home country GDP Growth (as percentage) in comparison to 2015	192		2.34%	4.76%	-10.64%	40.68%	UN and IMF
Developed	Whether airline's home country (in case of a internationalized company) of operation is a developed or emergent economy according to UN classification	192		0.417				UN Data
InfoCredit	The index ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions.	192					0.0	8.0 World Bank Data
BrandRelationship	Brand relationship criterion: whether the airline being considered has also its brand under a internationalization process in 2016	192		0.406				CAPA and Companies' Websites
CompanyAge	Airline time of operation since establishment until 2016 in years	192		34.599	28.5	1.0	97.0	ICAO
PrivateOwnership	Ownership structure of the airline regarding public sector and private ownership	192		0.583				CAPA, Companies Investor relations' Website, Yahoo Finance and Bloomberg
IATAMember	Whether airline is member of commercial organization IATA	192		0.630				ICAO
LCC	Carrier business model type according to European commission classification	192		0.365				CAPA

Source: ICAO. (2016). List of government-owned and privatized airlines. Retrieved from [https://www.icao.int/sustainability/SiteAssets/Pages/Eap\\_ER\\_Databases/FINAL\\_Airlines%20Privatization.pdf](https://www.icao.int/sustainability/SiteAssets/Pages/Eap_ER_Databases/FINAL_Airlines%20Privatization.pdf); ICAO. (2017). List of Low-Cost-Carriers (LCCs). Retrieved from <https://www.icao.int/sustainability/Documents/LCC-List.pdf>

As to variability within data sampled, both internationalization via decision rights allocation in an airline alliance or brand property rights sharing enabled through a brand internationalization strategy can be better assimilated with information provided in figures 5 and 6. To illustrate, while 88 airlines sampled do pertain to an airline alliance, only 29 choose to simultaneously allocate rights via an international brand.

### 3.4 Testing Econometric relations among Business Models, Brand, Alliances and Institutions

#### 3.4.1 Establishing the empirical model

In respect to econometrics, airline internationalization process such as the event of being a member of an airline alliance at a certain time can be analysed via binary regression models, such as the logit and probit in line with what was developed by Klein et al. (2015). As it is the case for this study, information on the presence of a foreign airline in a given country through the form of an airline alliance, e.g. Skyteam, can be translated into a binary variable with assumes a value of 1 for positive presence and 0 for an absence of the phenomenon for the individual airline under observation. For such event it is considered here a binomial distribution (Equation 1). Besides, events like the internationalization of brand of a certain airline to a foreign country, e.g. KLM Asia, can also be interpreted as binary information. As classical literature discuss, in such binary response cases for the dependent variable, a transformation can be applied to this information so that a continuous model is used (GUJARATI; PORTER; GUNASEKAR, 2012; HOSMER; LEMESHOW; STURDIVANT, 2013; JEFFREY M. WOOLDRIDGE, 2013). This transformation can be done via a logistic function. Mathematically, such distribution jointly to a generalized linear regression model is given by Equation 2. A set of  $n$  independent explicative variables can be represented by the vector  $\mathbf{X} = (1; X_1; X_2; X_3; \dots; X_n)$  and  $\pi(x)$  can represent a link function, for example, in the logistic form, what would result in a multiple logistic regression model for the estimation of parameters  $\beta_i$  - with  $i = (0, 1, 2, \dots, n)$  - in vector  $\boldsymbol{\beta}$ . Still, for the link function  $\pi(\cdot)$  it is defined the logit relation, in which for a given probability  $\pi$  the logit function will be the logarithm of the odds of  $\pi$ :  $\text{logit}(\pi) = \ln\left(\frac{\pi}{1-\pi}\right)$ .

$$Y_i \sim B(m_i, \pi_i), \quad P(Y_i = y_i) = \binom{m_i}{y_i} \pi_i^{y_i} (1 - \pi_i)^{m_i - y_i} \text{ (eq. 1)}$$

$$\ln\left(\frac{\pi_i}{1 - \pi_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \text{ (eq. 2)}$$

In this last equation,  $\pi(x_i)$ , a link function, represents the probability of occurrence of the phenomenon under study. This way, it is possible to obtain a model for the average response, i.e., the expectation about the internationalization process of airlines. This model is denoted if

we go back to Equation 1, if adjusted to  $E(Y|X) = \pi(X) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n}}$ , to which estimation of parameters  $\beta_i$  is obtained by the maximum likelihood estimator.

### 3.4.2 Empirical Model Equation

As to the model being discussed here, three levels of analysis are to be investigated, namely, macroeconomic conditions (identified through the variables *FDIperGDP*, *GDP Growth*, *Developed*, and *InfoCredit*), firm and market characteristics (*BrandRelationship*, *CompanyAge*, and *PrivateOwnership*), and finally regulatory conditions (described by *IATA* and *LCC*). Combining these fields into a logistic regression model would enable an estimation of parameters to be further discussed here as to their pointed effects onto the airline internationalization process under a property rights and economic institutions framework of investigation.

Alliance Membership

$$\begin{aligned}
 & \text{Prob}(Y_i|X_i) = \pi(X_i) = \text{logit}^{-1}[\pi(X_i)] = \beta_0 \\
 & \begin{array}{l}
 \text{Macroeconomic Variables} \\
 \text{Competition Variables} \\
 \text{Regulatory Variables}
 \end{array}
 \left\{
 \begin{array}{l}
 + \beta_1 \textit{FDIperGDP} \\
 + \beta_2 \textit{GDPGrowth} \\
 + \beta_3 \textit{Developed} \\
 + \beta_4 \textit{InfoCredit} \\
 + \beta_5 \textit{BrandRelationship} \\
 + \beta_6 \textit{CompanyAge} \\
 + \beta_7 \textit{PrivateOwnership} \\
 + \beta_8 \textit{IATAMember} \\
 + \beta_9 \textit{LCC} \\
 + \varepsilon
 \end{array}
 \right. \quad (\text{Eq. 3})
 \end{aligned}$$

Source: The author

This specific model (Equation 3) uses maximum likelihood estimation (MLE) rather than ordinary least squares (OLS) to estimate the parameters, and thus relies on large-sample approximations. Through this method, a first identification of seemingly influential variables to the internationalization process of airlines is to be performed. Computational tools are employed in this analysis so that results can be organized and presented in a comprehensive

manner. In terms of model specification and error analysis, given by the term  $\varepsilon$  in equation. 3, it is important to consider a measure which provides goodness of fit. Namely, three methods are employed, the estimation via log-likelihood, Akaike's information Criterion (AIC) and lastly, a version of Hosmer-Lemeshow test (HOSMER; LEMESHOW; STURDIVANT, 2013). This last test is to be further validated through a graphical analysis which compares differences between observed and expected numbers of outcomes regarding the presence of an airline in a strategic alliance. Sample was divided in ten groups ( $g = 10$ ). To calculate how many  $Y=1$  observations we would expect, the Hosmer-Lemeshow test takes the average of the predicted probabilities in each of the groups.

## 4 RESULTS AND DISCUSSION

Results for the performed analysis are shown in table 3 and econometric issues and choice of estimator were derived from a thorough analysis. Firstly, only variables at the macroeconomic levels were employed in Model 1 with respect to the explained variable (AllianceMember). Then, Model 2 adds the second variable of interest (BrandRelationship). Next, competitive variables were included (Model 3). In Model 4, with the inclusion of regulatory measures, all variables are then considered. Model 5 is obtained by a stepwise optimization algorithm, including a two-way interaction between covariates. For all models the same statistical reasoning presented in previous sections were employed, that is, same estimators, same link function. From the parameters chosen for model adequacy, Model 4 presents a better fit considering the significance level obtained for the H-L Test p-value whereas Model 5 levels of Log Likelihood evidence a best fit. Errors are analyzed by a grouped comparison between estimated and observed values of fitted probabilities (see Figure 7).

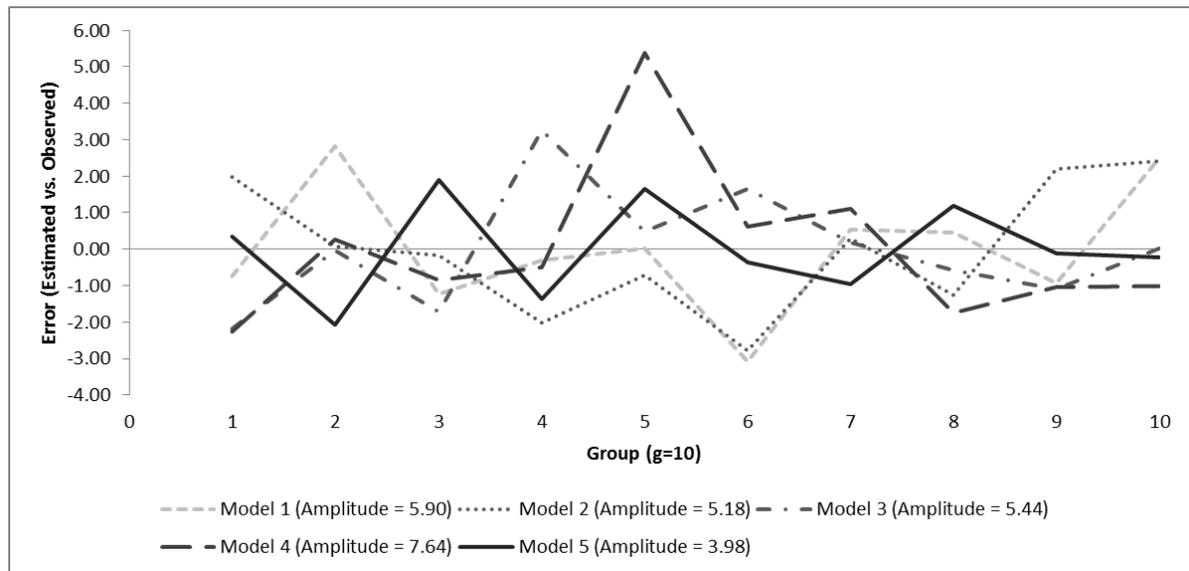
Table 2 - Estimated Logistic Regression Models

Estimated Logistic Regression Models					
	AllianceMember				
	Model 1	Model 2	Model 3	Model 4	Model 5
FDIperGDP	0.112 (0.151)	0.15 (0.153)	0.126 (0.17)	0.006 (0.182)	
GDPGrowth	0.153 (0.173)	0.198 (0.185)	0.125 (0.197)	-0.014 (0.192)	
Developed	0.099 (0.309)	0.041 (0.316)	-0.356 (0.391)	-0.295 (0.417)	
InfoCredit	0.528** (0.209)	0.599*** (0.21)	0.843*** (0.243)	0.592** (0.254)	0.612** (0.255)
BrandRelationship		-0.787** (0.316)	-0.349 (0.397)	0.265 (0.461)	0.929 (0.615)
CompanyAge			1.419*** (0.249)	1.123*** (0.277)	1.628*** (0.382)
PrivateOwnership			-0.399 (0.409)	-0.402 (0.453)	
IATAMember				1.911*** (0.512)	3.493*** (0.944)
LCC				-0.479 (0.545)	-1.323 (2.048)
LCC*CompanyAge					-5.326*** (2.033)
LCC*BrandRelationship					-2.924*** (1.059)
LCC*IATAMember					-3.213*** (1.241)
Constant	-0.278 (0.201)	0.056 (0.243)	0.327 (0.314)	-1.114** (0.545)	-2.970*** (0.912)
Observations	192	192	192	192	192
Log Likelihood	-127.922	-124.72	-95.055	-83.844	-73.258
Akaike Inf. Crit.	265.845	261.439	206.11	187.687	164.516
Hosmer-Lemeshow Test	0.7336	0.5124	0.4410	0.0317**	0.2945

Notes: Standard Errors in parenthesis; \*\*\*Significant at the 1 percent level; \*\*Significant at the 5 percent level; \*Significant at the 10 percent

Source: The author

Figure 7 - Logistic Regression Model Errors for the four models employed.



Source: The author

As observed from the analysis, IATA Membership comes with little to none surprise as it is a kind of precondition for engaging into commercial agreements with airlines from foreign origin provided with its 290 member airlines corresponding to 82% of total world air traffic, airlines associated to IATA can benefit from transactions with companies that share a vast majority of world air network, e.g. setting commercial agreements for code-sharing across different regions; Company age (which can somewhat represent companies' market strength) is significant. Means some quality reputation must be earned, or that managerial skills must accumulate before such hybrid form is adopted; Among Macroeconomic variables, credit access is the sole one to show significance. If something can be said from this, it would mean that airlines with growth potential through access to loans are more likely to be part of an alliance. Furthermore, being a proxy measure for the institutional environment of the different countries, this result on *InfoCredit* variable, leads us to add in the discussion by empirically showing that level of consistency and transparency institutions favours international business; GDP growth without significance comes with no surprise, as this is something multi-sectorial and airline alliance membership is something that does not witness reversals coming from short term unfavourable macroeconomic conditions; Airline business model seems to be a major aspect determining how do the two hybrid forms correlate, and this is a finding from study. Considering its low operational cost strategy, LCC carriers face managerial and resources allocation issues when internationalizing and, although having no

clear effect if considered alone, this variable appears to have a significant impact if we model its interaction with age, IATA membership and brand. Retrieving the fact that building a solid reputation through years and being part of such international organizations as IATA takes not only several economic transactions costs but many governance developments, it is shown from model 5 that firms that do not afford such resources tend to internationalize not taking part in airline alliances.

On this issue, it is also worth noticing two aspects: first, at least two low-cost carriers are simultaneously active on internationalizing brands apart from airline alliances, namely Air Asia, JetStar. So, statistical negative correlation can be influenced by these cases. Second, and then transcending and maybe truly explaining the statistical effect, may lie the economic, managerial effect: it is common to observe low-cost airlines that were created (or early acquired, as the case of Ryanair) and are still led by the same person, and usually this person can exhibit personalities that favours quest for internalized market strategies . In Asia, this is the case of Tony Fernandes and Air Asia; in Europe, one can observe Stelios Haji-Ioannou and EasyJet (despite his departing from the board in 2010), and Michael O'Leary and Ryanair. In North America, Herbert Kelleher and Southwest exemplifies (though Mr. Kelleher left the Chairman position in 2008). Albers et al. (2010) clearly documents these leaders as ones who appreciate such independence.

## 5 CONCLUSIONS

Main findings are twofold: first, in the sample, airlines do choose between two hybrid forms, meaning that they opt either to get involved in a brand internationalization experience or in an airline alliance, but not both. Explanation for this phenomenon lies on grounds of the resource-based view and on the complexities and ambiguities that may arise considering different governance structures and institutional environments in case one firm (airline) choose to pursue two different avenues in its internationalization process. Second, it is essential to notice that for this result to hold, one needs to control for the identity of the business model. It means that such exclusionary effect just arises for LCCs. In fact, when variables interact with the LCC business model, LCCs drag the contribution of company age and IATA membership too. LCCs are short in extensive managerial resources or, alternatively, they actually review different leadership vision. As a contribution, we investigate in quantitative terms how property and decision rights interrelate in the specific process of internationalization. Economic analysis of internationalization phenomena has been little revised, to the best of author's knowledge, particularly concerning a quantitative framework of exploration, but with little to non-existing contribution on quantitative field.



## POSTFACE: *It is better lose the saddle than the horse*

The author would like to express some final considerations regarding the once in a lifetime global circumstances in which this work has come to its conclusion. As optimistic as this postface's title may be, the *new corona virus* pandemic which started just at the beginning of the conclusion of this Master's Thesis has put world population under threat in political, economic and, more importantly, public health spheres. Regarding the international air transport sector, consequences were tremendous. Airlines had to face hard strategic decisions provided that most part of the world has got isolated at their homes and demand for travelling reached extremely low levels given the new remote way of life, in some cases, even enforced by law. The aim of this section is to give some further analysis and relate this unprecedented situation to the subject of this work and maybe shed some light on the motives of airlines de-internationalization caused by the 2020's covid-19 outbreak.

Starting from the economic location in which this work has been produced, even before the pandemic has brought pressure over aviation sector, consequences such as the discontinuing of *Avianca Argentina* services in Argentina, on June 2019, and the bankruptcy of *Avianca Brazil*, on December 2019, had already been in place and changing Latin America's international aviation market. Both airlines were sister companies of Avianca holdings which is based in Colombia. Brazilian Avianca, more specifically, is part of the sample used in this research and could be seen as an example of internationalization through brand, once it had the right to use Avianca's brand in its operations. Another relevant change in the context of this work was the shutdown of *LATAM Argentina* (a subsidiary of Chilean based LATAM airlines group). In this case, the airline group chose to cease its operations in Argentina due to brutal losses that both the pandemic and government fiscal policies that were in place just accelerated. LATAM is an example, in respect of this work, of a hybrid form of organization which pertains to an airline alliance and also chooses to license its brand internationally across Latin American airlines.

One can observe that *new corona virus* pandemics has had similar impacts on airlines and alliances strategic decisions, that is, in order to preserve the core of its main original operations, some companies decided to stop operating on some foreign institutional environments so that they can survive this crisis. This is the case for Thailand's long-haul

LCC NokScoot Airlines which entered liquidation and the shutdown of *Avianca Peru* (an Avianca Holdings subsidiary).

After enumerating these downside facts provoked by the virus, some other movements could also be observed in the international air transport industry. For instance, China Southern strategically decided to leave the Skyteam Alliance to preserve only bilateral and selected partnerships/agreements with other airlines; Both Alaska Airlines and Royal Air Maroc have established contracts to enter Oneworld airline alliance what will increase their access to international markets. Therefore, these facts can be translated into a final statement in order to highlight the dynamics of internationalization phenomena in the commercial aviation sector as well as to invite observers to explore not only how rights and economic transactions interrelate in this process but also paths of internationalization after this world pandemics.

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## Appendix A – Airlines Sampled for the Analysis by global region

**Africa**

<b>Airline</b>	<b>Country</b>	<b>Alliance Member</b>	<b>Internationalized Brand</b>
Air Arabia Egypt	Egypt	No	Yes
AlMasria Universal Airlines	Egypt	No	No
Egyptair	Egypt	Yes	No
Nile Air	Egypt	No	No
Ethiopian Airlines	Ethiopia	Yes	No
Kenya Airways	Kenya	Yes	No
Comair	South Africa	Yes	Yes
kulula.com	South Africa	No	No
South African Airways	South Africa	Yes	No
South African Express Airways	South Africa	No	No
Swaziland Airlink	Swaziland	No	Yes
Tunisair	Tunisia	No	No
TunisAir Express	Tunisia	No	No

**Asia and Pacific**

<b>Airline</b>	<b>Country</b>	<b>Alliance Member</b>	<b>Internationalized Brand</b>
Jetstar	Australia	No	Yes
Qantas	Australia	Yes	No
Tiger Airways Australia	Australia	Yes	Yes
Virgin Australia	Australia	No	Yes
Biman Bangladesh Airlines	Bangladesh	No	No
Druk Air (Royal Bhutan Airlines)	Bhutan	No	No
Air Changan	China	No	No
Air China	China	Yes	No
Beijing Capital Airlines	China	No	No
China Airlines	China	Yes	No
China Eastern Airlines	China	Yes	No
China Southern Airlines	China	Yes	No
EVA Air	China	Yes	No
Lucky Air	China	Yes	No
Mandarin Airlines	China	Yes	No
Shandong Airlines	China	No	No
Shanghai Airlines	China	Yes	No
Shenzhen Airlines	China	Yes	No
Sichuan Airlines	China	No	No
Spring Airlines	China	No	Yes
Tianjin Airlines	China	No	No
Tigerair Taiwan	China	No	Yes

Xiamen Airlines	China	Yes	No
Cathay Dragon	China, Hong Kong	Yes	No
Cathay Pacific	China, Hong Kong	Yes	No
HK Express	China, Hong Kong	Yes	No
Hong Kong Airlines	China, Hong Kong	No	No
AirAsia India	India	No	Yes
GoAir	India	No	No
Jet Airways	India	No	No
JetLite	India	No	No
Citilink	Indonesia	No	No
Garuda Indonesia	Indonesia	Yes	No
Indonesia Air Asia	Indonesia	No	Yes
Indonesia Air Asia X	Indonesia	No	Yes
Lion Air	Indonesia	No	Yes
Tigerair	Indonesia	Yes	Yes
AirAsia Japan	Japan	No	Yes
All Nippon Airways	Japan	Yes	No
Japan Airlines	Japan	Yes	No
Jetstar Japan	Japan	No	Yes
Ryukyu Air Commuter	Japan	No	No
Skymark Airlines	Japan	No	No
Solaseed Air	Japan	No	No
Vanilla Air	Japan	Yes	No
Pegasus Asia	Kyrgyzstan	No	Yes
Lao Airlines	Lao People's Democratic Republic	No	No
AirAsia	Malaysia	No	Yes
AirAsia X	Malaysia	No	Yes
Malaysia Airlines	Malaysia	Yes	No
Golden Myanmar Airlines	Myanmar	No	No
Myanmar Airways International	Myanmar	No	No
Myanmar National Airlines	Myanmar	No	No
Yangon Airways	Myanmar	No	No
Nepal Airlines	Nepal	No	No
Air Nelson	New Zealand	No	No
Air New Zealand	New Zealand	Yes	No
Mount Cook Airlines	New Zealand	No	No
Shaheen Air International	Pakistan	No	No
Philippines AirAsia	Philippines	No	Yes

Asiana Airlines	Republic of Korea	Yes	No
Jeju Air	Republic of Korea	Yes	No
Korean Air	Republic of Korea	Yes	No
T'way Air	Republic of Korea	No	No
Polynesian Airlines	Samoa	No	No
Virgin Samoa	Samoa	No	Yes
Jetstar Asia	Singapore	No	Yes
Silkair	Singapore	No	No
Singapore Airlines (SIA)	Singapore	Yes	No
Solomon Airlines	Solomon Islands	No	No
Srilankan Airlines	Sri Lanka	Yes	No
Nok Air	Thailand	Yes	No
NokScoot	Thailand	Yes	Yes
Thai AirAsia	Thailand	No	Yes
Thai AirAsia X	Thailand	No	Yes
Thai Airways International	Thailand	Yes	No
Thai Lion Air	Thailand	No	Yes
Thai VietJet Air	Thailand	No	Yes
Air Vanuatu	Vanuatu	No	No
Jetstar Pacific	Viet Nam	No	Yes
VietJet Air	Viet Nam	No	Yes
Vietnam Airlines	Viet Nam	Yes	No

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## Europe

Airline	Country	Alliance Member	Internationalized Brand
Austrian Airlines	Austria	Yes	No
Niki	Austria	Yes	No
Brussels Airlines	Belgium	Yes	No
TUI fly Belgium	Belgium	No	Yes
Croatia Airlines	Croatia	Yes	No
CSA Czech Airlines	Czechia	Yes	No
Finnair	Finland	Yes	No
Air Corsica	France	No	No
Air France	France	Yes	No
ASL Airlines France	France	No	Yes
Corsair	France	No	No
Transavia France	France	No	Yes
Air Berlin	Germany	Yes	No
Eurowings	Germany	No	No

Germania	Germany	No	No
Lufthansa	Germany	Yes	Yes
Lufthansa City Line	Germany	Yes	No
SunExpress Germany	Germany	No	Yes
TUIFly	Germany	No	Yes
Aegean Airlines	Greece	Yes	No
Wizz Air	Hungary	No	Yes
WOW Air	Iceland	No	No
Aer Lingus	Ireland	Yes	No
Alitalia	Italy	Yes	No
Blue Panorama	Italy	No	No
Meridiana	Italy	No	No
Luxair	Luxembourg	No	No
Montenegro Airlines	Montenegro	No	No
KLM Cityhopper	Netherlands	Yes	No
KLM Royal Dutch Airlines	Netherlands	Yes	Yes
Transavia	Netherlands	No	Yes
Norwegian Air Shuttle	Norway	No	Yes
LOT Polish Airlines	Poland	Yes	No
TAP Portugal	Portugal	Yes	No
Blue Air	Romania	No	No
Carpatair	Romania	No	No
TAROM	Romania	Yes	No
Aeroflot Russian Airlines	Russian Federation	Yes	No
S7 Airlines (Sibir Airlines)	Russian Federation	Yes	No
Vostok Aviation Company	Russian Federation	No	No
Adria Airways	Slovenia	Yes	No
Air Europa	Spain	Yes	No
Iberia	Spain	Yes	No
Iberia Regional Air Nostrum	Spain	Yes	No
Vueling	Spain	No	No
SAS / Scandinavian Airlines	Sweden	Yes	No
Easyjet Switzerland	Switzerland	No	Yes
Swiss (Swiss International Air Lines)	Switzerland	Yes	No
Onur Air	Turkey	No	No
Pegasus Airlines	Turkey	No	Yes
SunExpress	Turkey	No	Yes
Turkish Airlines	Turkey	Yes	No
British Airways	United Kingdom	Yes	Yes
easyJet	United Kingdom	No	Yes
Flybe	United Kingdom	No	No
Virgin Atlantic Airways	United Kingdom	No	Yes

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## Latin America and Caribbean

<b>Airline</b>	<b>Country</b>	<b>Alliance Member</b>	<b>Internationalized Brand</b>
Aerolineas Argentinas	Argentina	Yes	No
LATAM Airlines Argentina	Argentina	Yes	Yes
Avianca Brazil	Brazil	Yes	Yes
LATAM Airlines Brasil	Brazil	Yes	Yes
LATAM Chile (Lan Airlines)	Chile	Yes	Yes
LATAM Express	Chile	Yes	Yes
Aero República (Copa Airlines Colombia)	Colombia	Yes	Yes
AVIANCA	Colombia	Yes	Yes
LATAM Airlines Colombia	Colombia	Yes	Yes
VivaColombia	Colombia	No	Yes
Avianca Ecuador	Ecuador	Yes	Yes
LATAM Airlines Ecuador	Ecuador	Yes	Yes
TACA	El Salvador	Yes	Yes
Aeromexico	Mexico	Yes	No
VivaAerobus	Mexico	No	Yes
Volaris	Mexico	No	Yes
COPA Airlines	Panama	Yes	Yes
LATAM Airlines Peru	Peru	Yes	Yes

## Middle East

<b>Airline</b>	<b>Country</b>	<b>Alliance Member</b>	<b>Internationalized Brand</b>
Air Arabia Jordan	Jordan	No	Yes
Jordan Aviation	Jordan	No	No
Royal Jordanian	Jordan	Yes	No
MEA - Middle East Airlines	Lebanon	Yes	No
Air Arabia Maroc	Morocco	No	Yes
Qatar Airways	Qatar	Yes	No
Saudia	Saudi Arabia	Yes	No
	United Arab		
Air Arabia	Emirates	No	Yes
	United Arab		
flyDubai	Emirates	No	No

## North America

<b>Airline</b>	<b>Country</b>	<b>Alliance Member</b>	<b>Internationalized Brand</b>
Air Canada	Canada	Yes	No
Air Canada Rouge	Canada	Yes	No
Air Inuit	Canada	No	No
Air Transat	Canada	No	No
Sunwing	Canada	No	No
Westjet Airlines	Canada	No	Yes
Westjet Encore	Canada	No	Yes
Interjet/ABC Aerolineas	Mexico	No	No
American Airlines	United States of America	Yes	No
Delta Air Lines	United States of America	Yes	No
Frontier Airlines	United States of America	No	No
JetBlue Airways	United States of America	No	No
United Airlines	United States of America	Yes	No
Virgin America	United States of America	No	Yes