EMPIRICAL ANALYSIS OF NETWORK CONSTRUCTION DETERMINANTS OF AZUL AIRLINES

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ABSTRACT
This paper examines the airline network construction of Azul, a Brazilian low-cost carrier, investigating which and how factors affect Azul's entry decision on domestic routes; and also analyze how Azul's merger with the regional airline Trip has affected its network planning decisions. To do so, a Probit econometric model of airline entry is used. Results show that Azul's business model is based on connecting new destinations, not served yet by rivals, to one of its hubs; and consistently avoiding dominant airlines at both route and airport levels. Regarding the effects of the merger, results suggest that Azul has shifted away from its original model based on JetBlue's towards a more regional-oriented model, increasingly entering shorter routes and regional airports.

RESUMO
Este artigo examina a construção de malha da Azul, uma companhia aérea brasileira do segmento *low-cost*, investigando quais e como os fatores afetam a decisão de entrada da Azul em rotas domésticas; e também analisa como a fusão da Azul com a companhia aérea regional Trip afetou o planejamento de malha da companhia. Para isso, um modelo econométrico Probit será usado para entender o modelo de entrada da companhia aérea. Os resultados mostram que o modelo de negócios da Azul é baseado em conectar novos destinos, ainda não servidos por seus concorrentes, a um de seus hubs; e consistentemente evitar rotas ou aeroportos dominados por outras companhias aéreas. Em relação aos efeitos da fusão, os resultados sugerem que a Azul se afastou do seu modelo de entrada original, baseado na JetBlue, para um modelo mais orientado à aviação regional, entrando em rotas mais curtas e em aeroportos regionais.

1. INTRODUCTION

Since the U.S. airline deregulation, the growth of low-cost carriers (LCCs) has been attracting attention from several parties in the industry. This can be explained by the impact these types of airlines have been doing in the expansion of the aviation industry. In 2015, LCCs carried more than 980 million passengers, which represent 28% of the world total scheduled passengers (ICAO, 2019). These marks are accomplished by the low-cost low-fare model, in which airlines offer limited passenger services ("no-frills"), among other characteristics, to reduce its operation costs and lower its ticket prices, serving price sensitive passengers, usually leisure oriented, who would otherwise use another mean of transport or not travel at all.

In this context, this paper considers the case of Azul Airlines in the Brazilian domestic air transport industry. Azul Airlines is a low-cost carrier founded by 2008 by David Neeleman, the same founder of JetBlue, one of the biggest American LCC and which served as model for Azul. Neeleman decided to establish Azul in the Brazilian market due to the expansion of the LCC Gol in this market in the 2000s (Oliveira, 2008) and especially due to Varig's bankruptcy, which was one of the biggest Brazilian airlines at the time (Oliveira, 2017). Azul started with only 3 destinations in December, 2008, serving the following airports: Viracopos, Salvador and Porto Alegre.

Today, Azul is the third biggest airline in Brazil, serving 104 destinations and responsible for 30% of the total number of departures in the country (Azul, 2019). And to continue growing, Azul has announced in 2018 its intention to enter up to 35 new destinations in the next few years, 25 of them being domestic cities (Azul, 2018). Most of these cities are located in the South, Southeast and Northeast regions of Brazil, which brings the following questions: how

does Azul choose which cities it will serve in the future? What characteristics are important to Azul and what are their effects on entry? Are they positively or negatively affecting the entry probability? Thus, one of the objectives of this paper is to answer these questions regarding the entry determinants of Azul and its effects.

Another objective of this paper is to analyze the effects of a merger on an airline's entry decision. One turning point in Azul's story was its merger with Trip Airlines in May, 2012. Trip was a Brazilian, and at the time the biggest Latin America regional airline, which helped Azul to expand its domestic network, especially in the North and Northeast regions of Brazil, bumping the Azul's number of served directional city-pairs from 259 to 594 after the merger. After this operation, one can ask: how did the merger affected Azul's entry decision after May, 2012? How does a merger between a low-cost airline with a regional airline impacts the former's entry model? Thus, this paper will take this event into account and compare Azul's entry behavior before and after the merger and look for evidences of entry pattern changes.

Finally, this paper also compares Azul's entry determinants with JetBlue's, the airline Azul was based on its foundation. Both being founded by Neeleman, Azul was his attempt to bring JetBlue's business model to the Brazilian airline market. Being so, this paper will compare both airlines entry model, and in case of Azul, it will also account for the period before and after the merger and check when its business model was the closest with JetBlue's.

The next sessions of this research is divided as follows: Section 2 presents the discussion of the literature on LCC entry determinants. Section 3 presents the econometric model and a description of the variables used. Section 4 presents the estimation results and discussions. Section 5 presents the conclusions of this research.

2. LITERATURE FOR ENTRY PATTERNS OF LCCS

Since the Airline Deregulation Act in the U.S., the academy has been concerned by the airline market competition with questions regarding prices and route entry by airlines. Several studies have been done in those areas since the U.S. deregulation, especially when other regions started their own airline market deregulation, like Europe or some countries in South America and Asia, proving the universality of the subject. There are two main lines of research regarding low-cost carriers' entries in a market: (a) the first line of research is concerned by the entry effects and responses to the LCCs entries by its competitors; (b) the second, which is the focus of this paper, studies the LCC entry patterns in a market. It is concerned by LCC's choice to operate in an airport or route given its characteristics.

Ito & Lee (2003) analyzed the growth of LCCs in the U.S. airline industry and the factors that influence their entry. According to their research, the most impactful predictor of a LCC entry is market density. Boguslaski et al. (2004) further expanded the literature by analyzing the Southwest Airlines, the biggest LCC in the world, and the evolution of its entry strategies over the years, finding a change in behavior in choosing routes to operate, going from dense and short-haul markets to thin and long-haul markets. Both these papers lead to believe that network carriers will be more exposed to LCC competition over the years, as the latter is not bound to fly only dense and short-haul markets and serve leisure passengers anymore, which is known as "Southwest Paradigm".

Oliveira (2008) analyzed the Gol's entry pattern in Brazil, and the author concluded that the airline's entry behavior was consistent with the classic Southwest Paradigm – focusing on

dense and short-haul routes – but the author also found evidence that Gol was changing its entry pattern in the later period of its data sample, pairing with the results found by Boguslaski et al. (2004).

Müller et al. (2012) studied the entry pattern of the LCC JetBlue Airlines in the U.S. domestic airline industry. They showed that JetBlue consistently avoided concentrated airports, and instead targeted concentrated routes, making use of secondary airports on thicker routes, avoiding competition with network carriers. They also showed that JetBlue targeted longer-haul markets on non-stop markets, consistent with its business model, and avoided slot-restricted airports and routes already operated by other LCCs.

Boguslaski et al. (2004) and Oliveira (2008) concluded that the LCC entry patterns were changing through the time was also studied by de Wit & Zuidberg (2012), in a research about the growth limits of the low-cost carrier model in the European and American airline market. They concluded saying that there was a sign of saturation in continental market for LCCs, pointing towards a strategy of decreasing frequencies and increasing route distances. They also pointed new business strategies that could be adopted by LCCs, which included shifting to primary airports, hubbing and acquiring or merging with other airlines.

Although cited by de Wit & Zuidberg (2012), the effect of an airline merger in its entry decision is a subject not well explored in the literature yet, so one of the main contributions of this research is to fill this gap in the literature, investigating how a merger can affect an airline's entry model by analyzing the case of Azul merging with Trip. In order to do so and answer the questions regarding Azul's entry determinants and possible changes in its behavior after the merger with Trip, an econometric model will be used.

3. EMPIRICAL MODELING

This paper's goal is to identify the factors which have influenced Azul's entry decisions in the Brazilian domestic routes. In order to achieve this goal, a Probit model is estimated using a panel data. The unit of observation is a domestic directional city-pair where Azul is presents, assuming that (a) airports within the same extended city area are represented by the city and the mean value of the airports' variables are used, and (b) the route São Paulo-Rio de Janeiro is different than Rio de Janeiro-São Paulo, thus counted as 2 different routes. The main reason to use city-pairs rather than airport-pairs as the observation unit is to understand Azul's geographic expansion since 2008, a reasoning also used by Boguslaski et al. (2004) in their research which they analyzed the Southwest's entry patterns.

The premise for the entry decision adopted in this research is based on the model used by Boguslaski et al. (2004), which an airline chooses to enter a market when it expects a positive profit. Let *ENTRY** be a latent variable that measures the post-entry profitability and it is related to a vector of observable market characteristics *X*, as shown in Equation (1):

$$ENTRY^{*} = X\beta + u, \quad (1)$$

where u is the random variable drawn from a normal distribution with a mean of zero and a standard deviation of one and β is the parameter of a market characteristic. Then the entry decision would be observed as Equation (2):

$$ENTRY_{kt} = \begin{cases} 1 \text{ if } ENTRY^* > 0 \\ 0 \text{ if } ENTRY^* \leq 0 \end{cases} = \begin{cases} entry \\ no\ entry, \end{cases} \quad (2)$$

where k indicates a directional city-pair and t indicates the time.

In order to determine the observable market characteristics that affect an airline entry, the present research builds up on the empirical specification of the previous studies of airline entries found in the literature, as Morrison & Winston (1990), Sinclair (1995), Dresner et al. (2002), Ito & Lee (2003), Boguslaski et al. (2004), Oliveira (2008), Gil-Moltó & Piga (2008) and Müller et al. (2012) In this literature, the entry decision is usually explained by characteristics of airport/city, route, demand and competition. In the present model, it will be considered four categories of variables: distance, demand, city-pair and competition. The following sub-sections will explain the variables used in this model:

A. Dependent variable

The dependent variable of this model is $ENTRY_{kt}$, which is the presence of Azul in a directional city-pair k at time t.

B. Independent variables

These are divided in four categories, as stated before, which are distance, demand, city-pair and competition.

Regarding the distance variables, the following variables will be used:

- $KM\ 500\text{-}1000_k$ – a dummy variable to account for city-pair k with a geodesic distance between 500 and 1000 km.
- $KM\ 1000\text{-}2000_k$ – a dummy variable to account for city-pair k with a geodesic distance between 1000 and 2000 km.
- $KM\ 2000m_k$ – a dummy variable to account for city-pair k with a geodesic distance higher than 2000 km.

The base case for these dummy variables is the city-pair k with a geodesic distance between 250 and 500 km.

Regarding the demand variables, the following will be used:

- PAX_{kt} – total number of revenue passengers on the directional flight segment of city-pair k and time t divided by the number of the days in the month, which is multiplied by 1000.
- $MAXCON_{kt}$ – a variable to account for the maximum number of passengers in connection between the endpoint cities of city-pair k and time t.
- $MAXCON_{kt}$ x $HUBAZ_{kt}$ – interaction between the variable $MAXCON_{kt}$ and the presence of Azul's hub in one of the endpoints of the city-pair k at time t.

- $TOURISM_{kt}$ – proportion of passengers in charter flights in the city-pair k at time t.

There are two city-pair variables:

- $LARGEHUB_{kt}$ – a dummy variable to account for the presence of a hub considered large by FAA (more than 1% of national passenger share) in one of the endpoints of the city-pair k at time t.

- $MAXDEL_{kt}$ – a proxy for airport congestion in one of the endpoints of city-pair k at time t.

And for the competition variables:

- HHI_{kt} – Herfindahl-Hirschman index of concentration of revenue passengers of city-pair k at time t.

- HHI_{kt} *x* $HUBAZ_{kt}$ – interaction between the variable HHI_{kt} and the presence of Azul's hub in one of the endpoints of the city-pair k at time t.

- $MAXHHI_{kt}$ – maximum Herfindahl-Hirschman index of concentration of revenue passengers in one of the endpoints of city-pair k at time t.

- $LCCMAJ_{kt}$ – a dummy variable to account for the presence of the LCC Gol in the city-pair k at time t.

- $LCCMED_{kt}$ – a dummy variable to account for the presence of the LCC WebJet in the city-pair k at time t.

- $RGCMED_{kt}$ – a dummy variable to account for the presence of the regional carrier Trip in the city-pair k at time t.

- $RGCSMA_{kt}$ – a dummy variable to account for the presence of a small regional carrier in the city-pair k at time t.

- $FSCMED_{kt}$ – a dummy variable to account for the presence of the full-service carrier Avianca in the city-pair k at time t. This variable was included in the model because Avianca was a small regional airline called OceanAir before May, 2010, and after its name change, most of its routes were incorporated by Avianca.

Henceforth, the indexes k and t will be omitted.

As stated in the beginning of this session, this data set consists of the panel data of domestic directional city-pairs in Brazil, and the time period considered was from December, 2008 to December, 2018, totaling 72.769 numbers of observations. The main data source is available from Civil Aviation Integrated System (SINTAC), which is within the National Civil Aviation Agency (ANAC) data system. All variables were extracted from SINTAC except MAXDEL, which was extracted from Active Regular Flight (VRA), also within ANAC's system. In order to better simulate Azul's entry decision, this model used 12-months-lagged variables, considering the entry planning horizon of the airline.

4. DISCUSSION OF RESULTS

This section will first present and discuss the estimation results for Azul's entry model, analyzing it through four different groups of variables: distance, demand, city-pair and competition. After the discussion of the results, it will present the comparison between Azul's entry model before and after the merger with JetBlue's entry model, which results were extracted from Müller et al. (2012).

4.1. Estimation results

Table 1 presents the estimation results for the following specifications: Column 1 considered the entire sample, from December, 2008 to December, 2018; Column 2 considered only the period before Azul's merger with Trip; and Column 3 considered only the period after Azul's merger with Trip.

Regarding the distance variables, the data shows that Azul avoids longer routes (Columns 1 and 3), but it wasn't always like this: before the merger, Azul had a positive and statistically significant coefficient for routes with distance between 1000 and 2000 km, showing its early preference for medium-long hauls, consistent with JetBlue's business model. After the merger with trip, its business model shifted from JetBlue's longer routes model to a regional oriented behavior, focusing on shorter routes and developing their regional business segment. These results also show that Azul does not follow the trend in the LCC entry pattern literature, which authors like Boguslaski et al. (2004), Oliveira (2008) and de Wit & Zuidberg (2012) observed that LCCs around the world were increasingly entering longer routes.

Table 1: Estimation results

	(1) All_sample	(2) Bef_merg	(3) Aft_merg
KM_250_500	base case	base case	base case
KM_500_1000	-0.1376***	-0.0070	-0.1968***
KM_1000_2000	-0.5952***	0.1986***	-0.7761***
KM_2000m	-0.9395***	-0.0346	-1.1739***
PAX	0.5861***	0.7097***	0.5468***
MAXCON	-0.1540***	-1.6880***	0.0497
MAXCON_HUBAZ	2.0523***	2.6634***	1.9789***
TOURISM	0.4302***	0.6894***	0.5335***
LARGEHUB	0.2633***	0.0336	0.3183***
MAXDEL	0.1016	0.5859***	-0.6837***
HHI	-2.3838***	-1.3319***	-2.6480***
HHI_HUBAZ	0.7528***	0.7497***	0.8326***
MAXHHI	-0.4521***	-3.4283***	-0.1726***
LCCMAJ	-0.9925***	-0.1399***	-1.2396***
LCCMED	0.7247***	0.2581***	-0.6811***
RGCMED	0.1553***	-0.0381	0.7694***
RGCSMA	-1.0299***	-0.1502***	-1.2384***
FSCMED	-1.1569***	-0.8705***	-1.1983***
r2_p	0.3879	0.4114	0.3381
r2_mz	0.6517	0.6942	0.5932
r2_ct	0.8119	0.8888	0.8096
r2_ctadj	0.6105	0.3216	0.4644
chi²	39099	7087	23532
N_Obs	72769	19301	53468

With respect to demand variables, some of them presented expected results according to the literature, e.g. *PAX* and *TOURISM*. Both of them have a positive and statistically significant coefficient, agreeing with previous studies. An interesting fact is the drop in the *PAX*'s coefficient value from before to after the merger, this time confirming Boguslaski et al. (2004), Oliveira (2008) and de Wit & Zuidberg (2012), showing that Azul is entering thinner routes when comparing to the period before the merger. Regarding the variable *MAXCON*, it presented a negative coefficient before the merger, showing that Azul used to avoid routes with high number of passengers in connection from other airlines, but after the merger this variable lost its significance, not being an important factor to Azul anymore. On the other hand, *MAXCON_HUBAZ*'s shows that Azul's business model is based on connecting its new served cities to its existing hubs by presenting a consistent and positive coefficient before and after the merger.

Regarding the city-pair variables: *LARGEHUB* shows that before the merger, Azul didn't take this factor in account to enter a route, but after the merger the positive and statistically significant coefficient shows that Azul enters its competitors' hubs; it could happen because these are large cities/airports, and Azul sees it as an opportunity to enter this market and grab some of its competitors' passengers. *MAXDEL* shows a paradigm shift from Azul: before the merger, Azul entered congested airports, but after the merger it starts to avoid these types of airports. The positive value before the merger can be explained by the early expansion of Azul in the Brazilian domestic market, entering congested airports/cities to stablish its position in the market, namely entering São Paulo and Rio de Janeiro cities. But after the merger, Azul had already stablished its position in the domestic market, and because of its regional business segment, it starts to avoid congested airports/cities. Another explanation for the negative coefficient for *MAXDEL* after the merger is that Azul doesn't avoid entering congested airports, and rather it can't enter these airports, as most of them are restricted in some way, e.g. slot restriction.

And with respect to the competition variables, a negative coefficient for *HHI*, both before and after the merger, shows that Azul consistently avoids routes dominated by other airlines, unless Azul itself can be the dominant one, as shown in the variable *HHI_HUBAZ*; when there is the possibility to connect a city to one of its hubs, and be the only airline in that route, Azul tends to enters this market, as shown by the consistently positive value for *HHI_HUBAZ*. Analyzing the airport dominance through *MAXHHI*, when it is concentrated, i.e. dominated by other airline, Azul avoids entering routes connecting to these airports, although its negative effects has diminished after the merger. Regarding the presence of other airlines in the route, *LCCMAJ*, *RGCSMA* and *FSCMED* presented negative values, showing that Azul avoids direct competition from Gol, small regional airlines and Avianca, respectively. *LCCMED* shows that before the merger the presence of WebJet in a route had a positive impact on Azul's entry, and after the merger it changes. The negative aspect of the presence of WebJet after the merger can be explained to its similarity to Azul's operation, thus Azul avoiding direct competition with WebJet, but the positive value before the merger can be explained by the strong presence of WebJet in Sao Paulo and Rio de Janeiro airports, which were some of the main airports that Azul entered after its foundation. And finally, *RGCMED* has no statistically significant coefficient for the period before the merger, and a positive coefficient after the merger; *RGCMED* being the dummy variable representing the presence of Trip in the route, its positive value after the merger can be explained by the incorporation of its routes by Azul.

From these results, one can extract the consistent variables through time and define Azul's core business model. These variables are: *PAX*, *TOURISM*, *HHI*, *MAXHHI*, *MAXCON_HUBAZ* and *HHI_HUBAZ*.

Regarding the first two variables, Azul is always keen to enter routes with high demand, being it for regular or charter passengers. It is something expected from most airlines: they enter a route when there is a demand for that market. Now *HHI* and *MAXHHI* shows that Azul always avoided direct competition at route and airports level when these are already dominated by another airline. But *HHI_HUBAZ* shows that Azul does in fact enter new destinations when it can be the dominant in that market and it usually connect these new destinations with one of its existing hubs, as shown by the variable *MAXCON_HUBAZ*.

In order to validate this hypothesis of Azul's core business model, this paper investigated the empirical evidences of Azul latest entries. It was discussed in this research that Azul was planning to enter 25 new domestic destinations in the next few years according to a 2018 press release. From that group of destinations chosen by Azul, 3 of them were already entered by the airline at the time this text is being written, and the cities are: Mossoró, Pato Branco and Toledo.

The three of them share the same distance characteristic: they are all connected to an airport within the 500 km distance, showing the regional aspect of Azul post-merger. Mossoró is connected to Recife, while Pato Branco and Toledo are connected to Curitiba. Recife is Azul's hub since 2017, and while Curitiba is not one of the hubs considered in this paper, Azul considers this airport as its "mini-hub", according to its institutional presentation. This shows that Azul's entry model is based on connecting new destination with its hubs or feed the closest airports, as suggested by *MAXCON_HUBAZ*. And finally, these routes are operated by Azul only, showing that it enters a route when it can be in the dominant position, as suggested by *HHI_HUBAZ*.

4.2. Comparing Azul with JetBlue

Using the results found in the previous sub-section., it is possible to compare the results from the present research with the results found by Müller et al. (2012). Their research investigated the JetBlue's entry pattern in the American domestic market, and because Azul was initially based on JetBlue's business model, this paper tried to compare their models. Three entry models were considered: Azul before the merger, Azul after the merger, and JetBlue. To be able to compare these different entry models from different papers, only the variables present or equivalent in both papers were used, which are: *KM*, *PAX*, *MAXCON_HUB*, *LARGE_HUB*, *HHI*, *MAXHHI* and *LCCMAJ*. The results are shown in Table 2, following the specification: Column 1 shows the results for Azul entry model before the merger with Trip; Column 2 shows the results for Azul entry model after the merger; and Column 3 shows the JetBlue entry model. The results for each variable is presented as following: "+" for a positive effect on entry, "-" for a negative effect on entry, and "0" for statistically non-significant coefficient, signaling a neutral effect on entry.

Starting with the similarities: all of them agree on the positive effect of *MAXCON_HUB*, i.e. Azul and JetBlue business models are based on entering new routes that can be connected to one of their hubs. On the other hand, the dominance of an endpoint airport or the presence of a LCC competitor affects negatively on their entries.

Table 2: Comparing Azul with JetBlue

Variables	(1) Azul_Before	(2) Azul_After	(3) JetBlue
KM	+	-	+
PAX	+	+	0
MAXCON_HUB	+	+	+
LARGEHUB	0	+	0
HHI	-	-	+
MAXHHI	-	-	-
LCCMAJ	-	-	-

Regarding the *HHI* of the route, Azul's business model consistently avoids this type of route, as shown by the negative effect on both Azul's models. On the other hand, *HHI* of the route is a positive indicator for JetBlue. Müller et al. (2012) explained that this result shows that JetBlue sees dominance of a route as a signal that there is a demand that can be claimed there by competing for price, as long the incumbent is not a LCC.

And then there are two similarities between Azul before the merger and JetBlue: both of them agree on positive effect of *KM* and no-significance on *LARGEHUB*. Starting with the hub variable, both models agree that the presence of a large hub in one of the endpoints of the route is not taken into account when planning for a route entry, as shown in both studies by a statistically non-significant coefficient. And finally, both of them prefer to enter longer routes, presenting a positive coefficient on the *KM* variable. This characteristic is a staple on the JetBlue business model, and Azul has brought this behavior to its operations in Brazil until its merger with Trip, when its business model shifted more towards a regional-LCC operation.

With these results, it can be said that the Azul's early business model, before its merger with Trip, was more similar with JetBlue business model. This is understandable, as the David Neeleman's intent, the founder of Azul and JetBlue, was to bring the latter business model to the Brazilian market. Although his intents, Azul has shown some different characteristics than JetBlue, e.g. divergence on the effect of route *HHI*: while JetBlue enters dominated routes to compete with its incumbents, Azul consistently avoided direct competition in this type of route, both before and after the merger. This difference and others that can be observed from both airlines in many different aspects can be attributed to the idiosyncrasies of each market that they are inserted on, with each company adapting its business model to serve its market's passengers.

5. CONCLUSION

The present research developed an econometric model of airline market entry, and in particular it was considered the case Azul's entry in the Brazilian domestic market. One of the objectives of this research was to compare Azul's entry model with the trend observed in the literature, in which LCC airlines were not operating based on the Southwest Paradigm anymore, and instead of entering short and dense routes they are increasingly entering longer and thinner routes. The results show that while Azul is indeed entering in thinner routes when comparing to its early entry model, it is also increasingly entering in shorter routes, between 250 and 500 km, thus disagreeing with the previous studies. This can be explained by its merger with Trip in 2012, a regional airline: after the merger, Azul focused more on its regional segment instead, connecting new served cities to its closest big airport, being it a capital airport or even Azul's hub.

Besides comparing Azul's entry model with the literature, this research also tried to investigate what characteristics Azul takes into account when choosing a new destination. There are some consistent results for all the period considered in this study: Azul's model is heavily based on creating connections with its existing hubs; Azul also consistently avoids concentrated routes and airports, thus avoiding direct competition with dominant incumbents; unless Azul itself can be the dominant airline in a route. Another objective of this research was to investigate the effect of a LCC merger with a different business model, in this case, a regional airline. One of the biggest changes in Azul's entry model was shifting from JetBlue based long-haul routes to regional consistent short-haul routes.

With these estimation results, we also have anecdotal evidence suggesting that Azul follows such strategy with respect to its most recent entries. The new destinations entered are all connected to one of Azul's hubs or mini-hubs, within a 500 km distance, and they were not explored by other airlines at the time of entry, confirming the results found in this research.

And finally, with the estimation results in hands it was capable to compare Azul with its original business model, JetBlue. Using the JetBlue's results found by Müller et al. (2012) a comparative table was created, showing that although both companies have their own idiosyncrasies, and the American and Brazilian airline market have its own characteristics, Azul's business model before the merger was more similar with JetBlue's.

The findings of this research are limited by the fact that it didn't take into account the different types of aircrafts used by Azul. The airline started its operation based on Embraer aircrafts, with capacities ranging from 106 to 118 passengers to serve medium-haul routes; after its merger with Trip it started using ATR aircrafts, with a capacity of 70 passengers and serving shorter routes; and since 2014 Azul started operating Airbus aircrafts, with a higher passenger capacity and able to serve longer-routes. It is therefore recommended that future studies take into account this variety of aircraft in Azul's fleet, with varying capacities and ranges, in order to estimate a model, especially on the effect of the distance variable on entry decision.

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