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The Effects of Dominant Airlines on Open Skies Agreements*

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Abstract

We investigate the determinants of open skies agreements among Latin-American countries, focusing on the impact of having a dominant airline on the willingness of countries to sign agreements with others. We find that, overall, the likelihood of signing agreements increases with trade volume, passenger traffic, and distance. In relation to our main question, we find that a having a dominant airline decreases the probability that third countries concede open skies agreement.

Keywords: Open skies, Agreements, Airlines, Air traffic, Transportation, Latin America.

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1. Introduction

Latin American civil aviation market moved nearly 200 million passengers in 2014, with over 90% as intra-regional traffic. Air travel within these countries has shown a steady growth of around 7% annually over the past five years. An important part of this traffic could be attributed to air transport agreements among Latin American countries that have reduced bilateral barriers to air traffic in the past decades. The evidence reviewed below suggests that agreements contribute to higher passenger traffic, but there are not studies looking at the basic question of why some countries are more likely to sign these agreements.

The determinants of free international trade agreements have been comprehensively analyzed in several contexts (Baier and Bergstrand, 2007; Baier, Bergstrand and Mariutto, 2014), but there has not been any equivalent research on air transport agreements. The reasons to expect different outcomes for air transit agreements compared to international trade ones are diverse. First, passenger transit is a more local phenomenon than general merchandise trade. Most airline traffic occurs between neighboring countries. Thus bilateral agreements would be more important than multilateral agreements for increasing traffic. Second, air transport services operate in a network of connections. So, efficient operation of airlines requires access to traffic hubs – airports — in order to access passengers. Third, security plays an important role in the industry. Countries put limits on the operation of foreign airlines on domestic air space. Finally, we have to mention that aviation regulatory agencies, which negotiate open skies agreements with third countries, usually have a home bias industry. They tend to protect domestic airlines from competition by international carriers.

The literature related to the air transport industry has mostly focused on the effect of liberalization policies on variables such as air tariffs, market structure, passenger traffic, and economic growth among others. Nevertheless, there is scarce research on the

likelihood of having a bilateral air transport agreement in Latin America. This paper aims to fill this gap in the literature.

Several papers have studied the effects of liberalization policies in the air transport market on different outputs. One of the first studies on the economic impact of air service liberalization was developed by Gonec and Nicoletti (2000). Their paper examines the effect of a bilateral air service agreement on prices of air passenger transport at the national and route level for OECD countries. They find that liberalization policies improve the market's competitive structure and produce a positive effect on productivity and a reduction in air tariffs.

Focusing on the US open skies agreements (OSA), Micco and Serebrisky (2006) study their impact on airfares and on the share of US imports arriving by air. They estimate that for developed and upper-middle income countries signing OSAs on average reduces airfares by 9% and increases the share of imports arriving by air by 7% three years after the OSAs is signed. One of their most interesting findings is the identification of a differentiated effect of air service liberalization on developed versus developing countries.

In the same line, Piermartini and Rousova (2008) study the impact of air service liberalization of passenger air traffic for a wide range of countries. Using a large sample of 184 countries, they find evidence of a positive and significant relationship between traffic volume and the degree of liberalization of the air market. Fu, Oum, and Zhang (2010) report similar findings for the United States. Their results suggest that liberalization has positive effects on competition, air passenger traffic, and productivity, and negative impact on air tariffs.

Despite the patent benefits of air liberalization, Latin America has not developed a fully liberalized internal air market equivalent to those found in North America and the European Union. Every nation negotiates bilateral open skies agreements with countries

both in and out of the region. These agreements provide rights to operate in their local airports and make air connections. At the individual level, countries have dissimilar preferences as to the openness of its markets. In this paper, we aim to explore which factors explain the propensity to establish these agreements. Additionally, as agreements differ in the degree of openness between two countries, we also look at differences between partial and free heaven agreements. We are the first in exploring these issues for Latin America countries and in distinguishing by agreement type

In particular, we explore the role of a dominant domestic airline in both countries. This is an interesting topic because the presence of a strong domestic airline may exert contradictory effects on creating an agreement. A country that possesses a dominant airline in the regional market may be pressed, by the company itself, to obtain open skies agreements with third countries so that its airline can expand its scope. We call this, the national champion effect. On the other hand, a country may be reluctant to grant air freedoms to countries that have dominant airline for the reason of protecting its air market from strong competition from foreign airlines. This is named the protectionist effect. In our empirical analysis, we try to shed light which of these effects are in line with the bilateral agreements in Latin America.

We find that the impact of distance between countries and passenger traffic is positive and statistically significant on the probability of having an agreement. The evidence is strong for the potential net benefits of agreements associated with higher international passenger traffic; nevertheless it is not robust in relation to the effect of trade on the probability of having an agreement. Furthermore, income differences negatively impact the probability of signing agreements, suggesting that agreements are more likely between countries with similar economic development. The impact of dominant airlines in the likelihood of having air freedom agreements is generally negative, but only significant for the protectionist effect hypothesis. Thus our findings seem to be

concordant with the idea that countries are less prone to concede traffic rights to countries that have airlines with relevant operations in the regional market.

This paper is structured as follows. In the second section, we describe the nature of air transport agreements. In the third section, we describe the data. The fourth section presents the empirical strategy. The fifth section discusses the results, and the last section concludes.

2. Air Transport Agreements

Open skies agreements between countries are bargained separately from the institutions of the World Trade Organization. The Chicago Convention classifies authorizations to operate flights within and between countries according to the Freedoms of the Air system. There are nine freedoms ranging from the most basic to the most commercially open. These air permits are negotiated between countries through bilateral agreements and usually based on the principle of reciprocity. Table 1 describes each of the nine freedoms.

The first two freedoms are operational, while those between the third and ninth are classified as commercially important. The third and fourth freedoms, which allow for a direct flight with a third country, are granted jointly and usually with few restrictions. Freedoms ranging from the fifth to the seventh, which allow airlines to transport passengers between two countries other than their own, are the most valuable in terms of openness because they allow airlines to exploit the advantages of network operation.

The civil aviation market is based on a network of connections so access to the main airports is crucial to the airlines' efficiency. For this reason, countries with high levels of traffic and a strategic location are reluctant to grant these connecting freedoms to foreign airlines since this opens routes that would otherwise be captive to their domestic airlines.

Finally, the eighth and ninth freedoms are the ones associated to domestic markets. With these permits foreign airlines may serve internal routes of another country. These authorizations are less common, being Chile, Paraguay and Uruguay the unique cases in the region. All above freedoms might be granted under some restrictions such as limits on flight frequencies, designated airports, or designated airlines.

3. Data

The main variables used in this paper are: air traffic data, trade data, and the existence and the characteristics of bilateral agreements. We obtain this information from the CLAC *(Comision Latinoamericana de Aviación Civil)* website. In particular, we check which countries have an agreement and, given the freedoms contained in it, we classify the agreement as partial or total in concordance with the description of the freedoms shown in Table 1. We define a partial agreement when the country i only concede 3th and 4th freedom to airlines of country j. A complete agreement is when country i provides also 5th and 6th freedom to a foreign airline of country j.

It must be noted that we do not have information on agreements between every pair of countries considered in the sample. In fact, the number of observations per country is not the same across the sample. For most of them, we have data on agreements with the rest of 13 countries, but not always. Table 2 shows exactly how much data we have for each country in the sample.

A second relevant point is that agreements are not necessarily symmetric. It can be the case that some countries, for example *i* and *j*, agree on some liberties for country *i* in country *j*, but not for country *j* in country *i*. The most notable example is Uruguay, which has 5 asymmetric agreements, followed by the Dominican Republic with 4 asymmetric agreements. Table 2 shows descriptive statistics for asymmetric agreements in the sample.

For the explanatory variable, we use data from diverse sources of public information. International trade data comes from the World Integrated Trade Solutions (WITS) software, which corresponds to information provided by the Commodity Trade Statistics Database. Bilateral trade is the sum of exports between countries during the period 2007 to 2011. The rest of economic, geographic, and demographic data comes from Penn World Tables and from the website of Andrew K. Rose at Berkeley.

In Table 3 and 4, we show descriptive statics for our dependent variables. Table 3 measures how many agreements or freedoms each country concedes to the rest of our sample, whereas Table 4 shows the quantity of bilateral agreements that each country obtains to operate in third countries. Both tables differ because an agreement between countries "i" and "j" is not necessarily equal to agreement between countries "j" and "i." That is the special feature of air transport market; the agreements are not necessarily reciprocal each other. As expected, there are relevant differences across countries. Some of them are more likely to sign agreements than other ones. Chile may be considered as the most open country with agreements with 77.8% of our sample and with almost 92% of the countries have an agreement with Chile. Other countries with high prevalence of bilateral agreements are Panama and México, both having agreements with more than 70% of Latin American countries. In contrast, Nicaragua, El Salvador and Jamaica have very few agreements and, most notably, Surinam and Trinidad and Tobago has none.

Table 5 and 6 shows information regarding the types of agreements. We would like to stress that there are more partial than total agreements and also important differences across countries. Chile, which has a very high number of agreements, also has a high proportion of total agreements. However, Panama, with very few agreements, also has many total agreements. In contrast, Argentina only establishes partial agreements. Thus, it is interesting to look at not only which variables can explain the probability of agreement, but also whether these variables affect the type of agreement.

Tables 7 and 8 report the importance of bilateral agreements on passenger traffic, that is the percentage of air traffic covered by an agreement for each country as a percentage of the total traffic within the countries in the sample. Almost all countries have over 90% of air traffic covered by agreements, however, there are some countries with higher levels of uncovered traffic such as Jamaica, Surinam, Nicaragua, Costa Rica and El Salvador.

Table 9 reports descriptive statistics about the main airline for each country. The information includes the first year of operation and the average passenger traffic between the years 2003-2011. Chile, Panama, and Colombia have the major airlines in our sample, which combined represent 46% percent of the total passenger traffic during the period.

4. Empirical Strategy

For modeling the decision to establish an agreement, we use a discrete choice model where the probability of agreement is given by:

$$\mathrm{P}(\mathrm{Agreement}=1)_{\mathrm{ij}}=\mathrm{G}(\delta \mathrm{W}_{\mathrm{ij}}+\varepsilon_{\mathrm{ij}})$$

Where W is a vector of explanatory variables for both countries. These variables are intended to capture effects from the potential net benefits of the agreement and also some aspects of political economy that could affect the probability of establishing an agreement.

As primary determinants of an agreement, we include a variable that captures how dominant an airline is in both countries. To do this, we calculate the importance in the Latin American market of the main airline in countries *i* and *j* respectively.

The index of domestic dominance is defined as follows:

$$index1_{ij}=\frac{\sum_j Pax\_Aer_j-Pax\_Aer\_Rut_{j(ij)}-Pax\_Aer\_Rut_{j(ji)}}{\sum Pax\_Total-Pax\_Rut_{ij}\ -\ Pax\_Rut_{ji}}$$

While the index of foreign dominance is the following:

$$index2_{ij} = index1_{ji} = \frac{\sum_i Pax\_Aer_i - Pax\_Aer\_Rut_{i(ij)} - Pax\_Aer\_Rut_{i(ji)}}{\sum Pax\_Total - Pax\_Rut_{ij} - Pax\_Rut_{ji}}$$

The variable Pax_Aer_j is the average of passengers transported by the main airline of country *j* during the period 2003 – 2011 within Latin America. $Pax\_Aer\_Rut_{ij}$ is the average of passengers transported by the main airline of country *j* during the period 2003 – 2011 within the route *i – j*. $Pax\_Aer\_Rut_{j(ji)}$ is the same as $Pax\_Aer\_Rut_{ij}$ except that the route is *j –i*. Pax_Rut_{ij} is the average of every passenger handle by the main airline during the period 2003 – 2011 in the route *i – j* within Latin America. Pax_Rut_{ji} is the same as Pax_Rut_{ij} except that the route correspond to *j – i*. Pax_total is the average number of passengers transported within Latin America. Finally the values are normalized between 0 and 100 to facilitate interpretation.

The index attempts to capture the relevance of a country's flag carrier regionally. Given that the importance of the airlines may be endogenous to the existence of an agreement, we exclude the traffic between both countries for calculating airlines' markets share.[1] In terms of political economy rationale, we expect that strong airlines may block the existence of agreements with other countries in order to maintain a dominant position in the market. In this case, the parameter should be negative. However, it also may be that higher market participation is related to higher competiveness of the domestic airlines, leading to the effect being positive on the probability of agreement.

The vector W includes also variables regarding the importance of the joint market and geographic characteristics than can affect the net benefits of the agreement. In the first

[1] Apart from that, we consider only the main airline for every country. For instance, Chile has two airlines serving international routes: LAN and Sky. The former moves ten times the traffic than the later for routes in international routes within America.

case, we include the international trade volume — averaged over the period 2003-2011 — between each pair of countries. We expect that agreements are more likely to be established when the given countries have higher mutual trade. We additionally include the quantity of passengers travelling between both countries given by the average during the period 2003-2011. In both cases, the expected impact would be positive because the net benefits of the agreement would be increasing the volume of bilateral trade and passenger traffic between both countries.

The geographic characteristics that control for differences in travelling cots between both countries t are the distance between countries *i* and *j,* and a dummy variable for countries with common border. In this case, we expect that larger travelling costs — measured by greater distance and not having a common border — increase the gains from the agreement and the probability of establishing one. This is because it is expected that the agreements reduce air tariffs and their impact should be relatively more important for more distant countries.

Additionally, we include the real income gap between countries.[2] In this case, we expect that countries with similar incomes have higher gains from agreements and thus are more likely to establish them. This can be explained by the fact that countries with similar income have more potential demand for air traffic. It is plausible to assume that international travels are a superior good or with high income-elasticity. In contrast, countries with dissimilar incomes might have problems to take advantage from agreements due to differences in economic development, for example differences in infrastructure deficit or demand for air travel.

In the case of the classification of partial or total agreements — depending on their characteristics — we estimate an ordered Probit, where the dependent variable takes

[2] The income gap is the difference between real GDP per-capita of the countries in logs.

three values: 0 (no agreement), 1 (partial agreement), and 2 (complete agreement). In this model, we can explore whether there are some factors that differentially affect the probability of establishing partial or complete agreements. As we shown in the data section, some countries are more prone to partial agreements than other ones.

5. Results

To give an idea of the relationships among the variables, in Table 10, we show the univariate regressions between the probability of an agreement and the covariates.[3] In general, our first estimation show that the only variable not related with the probability of agreement is the distance between countries. The rest of the variables, in particular the importance of the main airlines in both countries and the bilateral exchange of goods and people, are positively related with the likelihood of having an agreement.

The results for the multivariate regressions are shown in columns (1) and (2) of Table 11. In this case, when controlling for the rest of covariates, the impact of distance is positive and statistically significant. Most of the variables are significant and with the expected signs. The exception is common border, which is not significant. The evidence is strong for the potential net benefits of the agreements associated with a passenger traffic having a positive and significant effect on the probability of agreement. Finally, income differences negatively affect the probability of agreement, suggesting that agreements are more likely between countries with similar economic development.

The impact of having dominant airlines is generally negative, but only significant for the airline in the other country. Thus our findings seem to be concordant with the protectionist hypothesis. Countries of the region tend to be reluctant to concede

[3] This is interesting because some variables such as distance and common border have been found to be relevant determinants of international trade in gravity equations. When we include all the explanatory variables, we can see whether these variables exert an additional influence above what they do on bilateral trade.

freedoms when the other country has a dominant operator in the international airline market. The challenge of tougher competition for domestic airlines may be a disincentive to establish agreements with countries that have a highly competitive airline.

As variables related with bilateral international trade and passenger traffic are potentially endogenous, we check the robustness of these results using an IV estimation. For international trade, we use as instrument the average tariffs in both countries under the justification that lower tariffs increase international trade. For the average traffic between the countries, we use the average population of both countries because higher population should increase the number of travelers. The identification assumption is that tariffs and population affect bilateral trade and passenger traffic but do not affect that probability of agreements through other mechanisms.

We show the results of the IV estimation in column (3) of Table 11. Passenger traffic is positively associated with an agreement, corroborating previous results. However, trade is statistically not significant. Several of the other variables turn out to be not significant in this IV estimation, with the exception of the dominance of the airline in the other country. Thus our main results tend to be robust to endogeneity concerns: a higher exchange of passengers increases the benefits of an agreement, and a highly competitive airline in the other country tends to reduce the incentives to establish these agreements.

Table 12 shows the results for the ordered probit. In general, the results are consistent with previous evidence in relation with the importance of having higher exchange of trade and passengers. It can be noted that the probability of not having agreement is reduced with higher international trade and passengers' traffic, but higher bilateral exchange of passengers increases the probability of having partial and total agreements. In these estimations, there is evidence that airline dominance helps to explain differences in the degree of agreements for the foreign dominance's index, and confirm our previous results that domestic airline dominance is not significant.

Table 13 shows the results for IV-ordered probit. We use these estimations as a robustness check. The results are consistent with the previous evidence in relationship with the relevance of having higher passenger exchange. However the probability of having an agreement is reduced with higher bilateral exchange. It suggests that volume of trade between countries is not robust to endogeneity. Several of the other variables are not significant; nevertheless they maintain the same coefficient sign.

Two additional variables are also relevant. First, higher distance increases the probability of signing an agreement, but the impact is positive and higher on the probability of having a total agreement. Second, income differences have the expected signs. A higher dissimilarity increases the probability of not signing an agreement, and reduces the probability of either one having a partial or total agreement, corroborating previous results.

6. Conclusions

We have examined the factors that influence the existence of open skies agreements between Latin-American countries. We focus on the impact of having a dominant airline on the willingness of countries to sign agreements with third countries.

Our results show that the presence of dominant airlines is generally negative on the probability of having an agreement, but is only the importance of the airline in the other country is significant. Thus our findings seem to be concordant with the idea that higher airline dominance reduces the probability of establishing agreements between countries especially when the airline in the other country has larger market participation. The threat of stronger competition for domestic airlines may be a disincentive to establishing agreements with countries that have a highly competitive airline.

Our findings indicate that the probability of signing agreement increases with trade volume, passenger traffic, and distance. However, the volume of trade is not robust to

endogeneity while the other two are not. Finally, we find that the probability of signing an agreement decreases with the income gap and the results are robust to different identification strategies. This suggests that agreements are more likely between countries with similar economic development, corroborating previous results in related literature.

We think that this a first step for better understanding the main factors that explain open sky agreements in Latin America, and how these countries could reach higher integration. This can have important consequences for tariffs and intra-regional economic exchange that deserve deeper analysis.

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Table 1: Freedom of the Air

Freedom	Description
First	The right to fly across the territory of the foreign country without landing.
Second	The right to land on the territory of the foreign country without traffic purposes (technical stop).
Third	The right to fly and carry passengers from one's own country to another country.
Fourth	The right to fly and carry passengers from another country to one´s own country.
Fifth	The right to fly and carry passengers between two foreign countries on a flight originating or ending in one's own country.
Sixth	The right to fly and carry passengers between two foreign countries while stopping in one's own country.
Seventh	The right to fly and carry passengers between two foreign countries without stopping in one's own country.
Eighth	The right to fly and carry passengers inside of a foreign country while stopping in one's own country.
Ninth	The right to fly and carry passengers inside of a foreign country without stopping in one's own country.

Table 2: Asymmetric Agreements

Country 1	Country 2	Agreements
Costa Rica	Dominican Republic	0/1
Guatemala	Dominican Republic	0/1
Guatemala	Paraguay	0/1
Dominican Republic	El Salvador	1/0
Mexico	El Salvador	1/0
Peru	Paraguay	1/0
Colombia	Uruguay	0/1
Dominican Republic	Uruguay	1/0
Mexico	Uruguay	1/0
Panama	Uruguay	1/0
Uruguay	Peru	0/1

Notes: Countries have asymmetric air agreements in our sample. For instance, Costa Rica does not have an agreement with Dominican Republic, however Dominican Republic has an agreement with Costa Rica (0/1). Additionally Mexico has an agreement with El Salvador but El Salvador does not have an agreement with Mexico (1/0).

Table 3: Probability of Agreement

Country	Mean	SD	Observations
Argentina	0.667	0.485	18
Brazil	0.667	0.485	18
Chile	0.778	0.428	18
Colombia	0.611	0.502	18
Costa Rica	0.438	0.512	16
Dominican Republic	0.706	0.470	17
Guatemala	0.235	0.437	17
Mexico	0.882	0.332	17
Panama	0.722	0.461	18
Peru	0.588	0.507	17
Paraguay	0.667	0.488	15
El Salvador	0	0	17
Uruguay	0.353	0.493	17
Total	0.565	0.497	223

Table 4: Probability of Agreement

Country	Mean	SD	Observations
Argentina	0.833	0.389	12
Bolivia	0.615	0.506	13
Brazil	0.833	0.389	12
Chile	0.917	0.289	12
Colombia	0.833	0.389	12
Costa Rica	0.636	0.505	11
Dominican Republic	0.636	0.505	11
Ecuador	0.769	0.439	13
Guatemala	0.417	0.515	12
Jamaica	0.308	0.480	13
Mexico	0.833	0.389	12
Nicaragua	0.0769	0.277	13
Panama	0.667	0.492	12
Peru	0.583	0.515	12
Paraguay	0.800	0.422	10
El Salvador	0.167	0.389	12
Surinam	0	0	6
Trinidad and Tobago	0	0	13
Uruguay	0.667	0.492	12
Total	0.565	0.497	223

Note: The percentage corresponds to bilateral agreements that the rest of countries have with each other country in our sample. For instance, El Salvador does not have any agreements with the rest of the continent, nevertheless two countries have an agreement with it. (Mexico and the Dominican Republic). The reason is that agreements are not equal is because an agreement between countries "i" and "j" is not necessarily equal to agreement between countries "j" and "i." That is the special feature of air transport market; the agreements are not reciprocal each other.

Table 5: Types of Agreement

Country	No	Partial	Total	Observations
Argentina	6	12	0	18
	(33.33)	(66.67)	(0)	(100)
Brazil	6	7	5	18
	(33.33)	(38.89)	(27.78)	(100)
Chile	4	6	8	18
	(22.22)	(33.33)	(44.44)	(100)
Colombia	7	10	1	18
	(38.89)	(55.56)	(5.56)	(100)
Costa Rica	9	4	3	16
	(56.25)	(25)	(18.75)	(100)
Dominican Republic	5	4	8	17
	(29.41)	(23.53)	(47.06)	(100)
Guatemala	13	0	4	17
	(76.47)	(0)	(23.53)	(100)
Mexico	2	13	2	17
	(11.76)	(76.47)	(11.76)	(100)
Panama	5	9	4	18
	(27.78)	(50)	(22.22)	(100)
Peru	7	7	3	17
	(41.18)	(41.18)	(17.65)	(100)
Paraguay	5	4	6	15
	(33.33)	(26.67)	(40)	(100)
El Salvador	17	0	0	17
	(100)	(0)	(0)	(100)
Uruguay	11	5	1	17
	(64.71)	(29.41)	(5,88)	(100)
Total	97	81	45	223
	(43.5)	(36.2)	(20.8)	(100)

Notes: Numbers in brackets are in percentage terms.

Table 6: Types of Agreement

Country	No	Partial	Total	Observations
Argentina	2	10	0	12
	(16.67)	(83.33)	(0)	(100)
Bolivia	5	6	2	13
	(38.46)	(46.15)	(15.38)	(100)
Brazil	2	7	3	12
	(16.67)	(58.33)	(25)	(100)
Chile	1	4	7	12
	(8.33)	(33.33)	(58.33)	(100)
Colombia	2	7	3	12
	(16.67)	(58.33)	(25)	(100)
Costa Rica	4	4	3	11
	(36.36)	(36.36)	(27.27)	(100)
Dominican Republic	4	2	5	11
	(36.36)	(18.18)	(45.45)	(100)
Ecuador	3	9	1	13
	(23.08)	(69.23)	(7.690)	(100)
Guatemala	7	0	5	12
	(58.33)	(0)	(41.67)	(100)
Jamaica	9	3	1	13
	(69.23)	(23.08)	(7.690)	(100)
Mexico	2	7	3	12
	(16.67)	(58.33)	(25)	(100)
Nicaragua	12	0	1	13
	(92.31)	(0)	(7.690)	(100)
Panama	4	4	4	12
	(33.33)	(33.33)	(33.33)	(100)
Peru	5	5	2	12
	(41.67)	(41.67)	(16.67)	(100)
Paraguay	2	7	1	10
	(20)	(70)	(10)	(100)
El Salvador	10	1	1	12
	(83.33)	(8.330)	(8.330)	(100)
Surinam	6	0	0	6
	(100)	(0)	(0)	(100)
Trinidad and Tobago	13	0	0	13
	(100)	(0)	(0)	(100)
Uruguay	4	5	3	12
	(33.33)	(41.67)	(25)	(100)
Total	97	81	45	223
	(43.50)	(36.32)	(20.18)	(100)

Notes: Numbers in brackets are in percentage terms.

Table 7: Bilateral Traffic

Country	
Argentina	100
Brazil	99.42
Chile	99.96
Colombia	97.42
Costa Rica	35.32
Dominican Republic	97.57
Guatemala	0
Mexico	99.20
Panama	77.28
Peru	82.26
Paraguay	95.80
El Salvador	0
Uruguay	95.10

Table 8: Bilateral Traffic

Country	(%)
Argentina	100
Bolivia	83.31
Brazil	100
Chile	100
Colombia	99.15
Costa Rica	60.05
Dominican Republic	89.59
Ecuador	98.34
Guatemala	49.40
Jamaica	0
Mexico	94.67
Nicaragua	25.22
Panama	76.27
Peru	91.22
Paraguay	99.9
El Salvador	21.73
Surinam	0
Trinidad and Tobago	0
Uruguay	99.5

Table 9: Airline Dominance

Airline	Country	First Year of operation	Average quantity of Passengers (2003-2011)
LAN	Chile	1929	6.703.887
COPA	Panamá	1947	4.466.644
AVIANCA*	Colombia	1919	3.879.508
TACA*	El Salvador	1931	3.879.508
CIA.MEXICANA DE AVIACION	México	1921	3.702.913
TAM	Brazil	1961	3.048.209
LINEAS AEREAS COSTARRICENSES S.A.	Costa Rica	1945	1.607.633
AEROLINEAS ARGENTINAS	Argentina	1950	1.604.005
TACA PERU	Peru	1999	1.079.586
PLUNA	Uruguay	1936	885.737
LLOYD AEREO BOLIVIANO S.A.**	Bolivia	1925	570.887
TRANSP. AEREOS DEL MERCOSUR	Paraguay	1962	533.402
AEROLINEAS GALAPAGOS	Ecuador	1985	487.362
AVIATECA	Guatemala	1945	80.665
SURINAM AIRWAYS	Surinam	1955	21.343
AIR JAMAICA	Jamaica	1969	13.016
AIR SANTO DOMINGO**	Dominican Republic	1996	12.958
BWIA WEST INDIES AIRWAYS	Trinidad & Tobago	1939	9.573
SANSA	Nicaragua	1978	6.610

Notes: *Own elaboration based on CLAC database and airline's website. ** These airlines have the same number of passenger due to a fusion between companies, however this paper assumes that both countries share the same airline.

Table 10: Univariate Probit Estimations and Marginal Effects

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distance	-0.00268						
	(0.0487)						
Trade		0.154***					
		(0.0195)					
Passengers			0.0579***				
			(0.00742)				
Border				0.295***			
				(0.0743)			
Income Gap					-0.0579*		
					(0.0306)		
Domestic Index						0.0933***	
						(0.0152)	
Foreign Index							0.0161
							(0.0193)
Observations	223	223	223	223	223	223	223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Multivariate Probit Estimations and IV, and Marginal Effects

VARIABLES	**(1)**	**(2)**	**(3)**
Distance	0.300***	0.304***	0.170***
	(0.0709)	(0.0754)	(0.0291)
Trade	0.135***	0.133***	-0.022
	(0.0283)	(0.0301)	(0.0143)
Passengers	0.300***	0.0481***	0.0713***
	(0.0709)	(0.0110)	(0.0059)
Border	0.0629	0.0632	-0.0080
	(0.125)	(0.124)	(0.0564)
Income Gap	-0.0832**	-0.0702*	-0.0182
	(0.0377)	(0.0408)	(0.0210)
Domestic Index		0.0203	-0.0256**
		(0.0191)	(0.0129)
Foreign Index		-0.0506**	-0.0466***
		(0.0251)	(0.010)
Observations	223	223	223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Ordered Probit Estimations and Marginal Effects

VARIABLES	(1) **No Agreement**	(2) **Partial Agreement**	(3) **Total Agreement**
Distance	-0.123**	0.052*	0.070**
	(0.0601)	(0.0285)	(0.0349)
Trade	-0.065***	0.028**	0.0374***
	(0.0232)	(0.012)	(0.0135)
Passengers	-0.036***	0.0157**	0.021***
	(0.0112)	(0.0062)	(0.0064)
Border	0.0993	-0.047	-0.0514
	(0.096)	(0.0518)	(0.0461)
Income Gap	0.0502	-0.021	-0.028
	(0.0307)	(0.0139)	(0.0178)
Domestic Index	-0.0196	0.0084	0.0112
	(0.0194)	(0.0086)	(0.0111)
Foreign Index	0.0578*	-0.0247**	-0.033**
	(0.021)	(0.0109)	(0.0129)
Observations	223	223	223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: IV- Ordered Probit Estimations and Marginal Effects

VARIABLES	(1) **No Agreement**	(2) **Partial Agreement**	(3) **Total Agreement**
Distance	-0.088	0.017	0.0711
	(0.093)	(0.042)	(0.053)
Trade	0.083	-0.016	-0.067
	(0.085)	(0.016)	(0.087)
Passengers	-0.027	0.005	0.022
	(0.085)	(0.023)	(0.063)
Border	0.045	-0.008	-0.0365
	(0.080)	(0.025)	(0.057)
Income Gap	0.031	-0.006	-0.025
	(0.0346)	(0.015)	(0.020)
Domestic Index	-0.009	0.0017	0.007
	(0.014)	(0.0049)	(0.009)
Foreign Index	0.037	-0.0072	-0.030
	(0.036)	(0.017)	(0.019)
Observations	223	223	223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1