

Comparison of GDP against Air Passenger Traffic

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INTRODUCTION

The intent of this research paper is to identify if there is a relationship between Brazil's GDP and the number of air passengers in Brazil. Brazil's economy has been growing since the early 1990s up to 2014 and had been labelled as one of the economies of the future in the early 2000s. São Paulo and Rio de Janeiro are the two major cities in Brazil for both international and domestic traffic. The current major airlines in Brazil are Gol, LATAM, Azul and Avianca. GOL accounts for 36% of domestic traffic, with LATAM at 34.7%, Azul at 17.1% and Avianca at 11.5%. The São Paulo- Rio de Janeiro route is the 4th busiest route in the world with almost 40,000 departures between the two cities in 2017.

CURRENT INFRASTRUCTURE

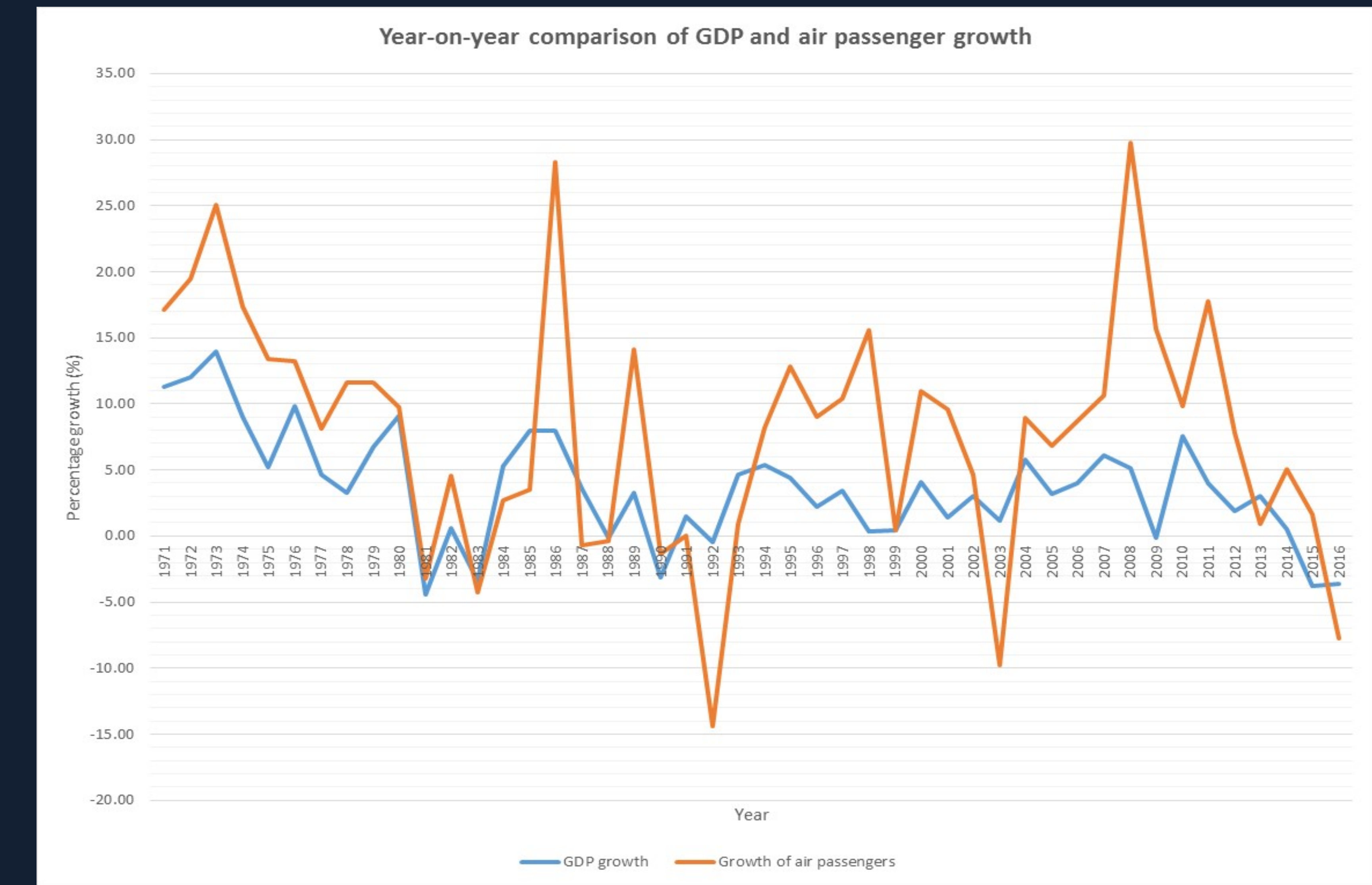
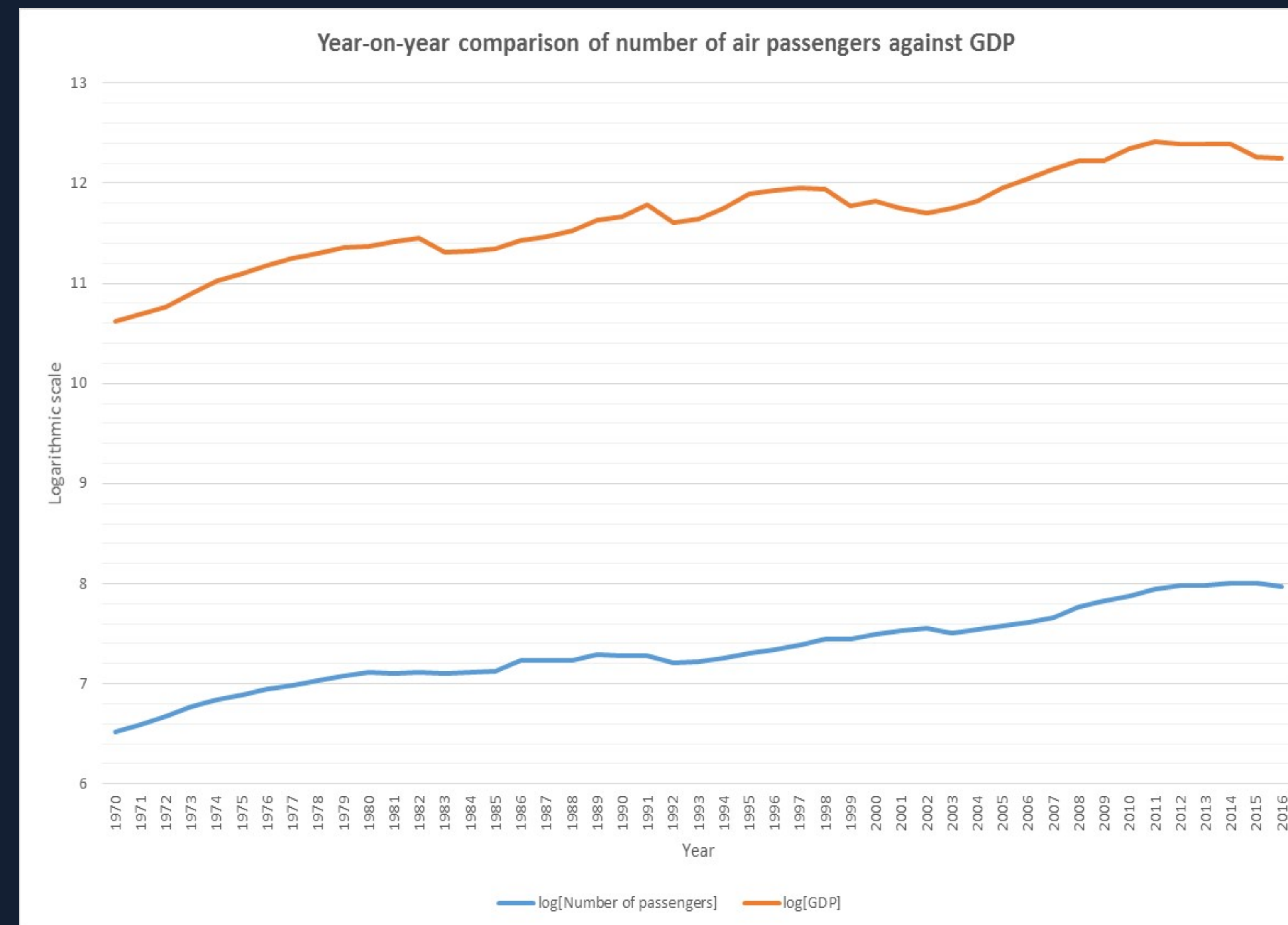
Main airports in Brazil

The top 5 busiest airports in Brazil are: Guarulhos International Airport, São Paulo (37.8m passengers), Congonhas Airport, São Paulo (21.8m), Brasília International Airport, Brasília (16.9m), Galeão International Airport, Rio de Janeiro (16.2m) and Belo Horizonte International Airport, Belo Horizonte (10.1m). The 2 main international gateways in Brazil are Guarulhos International Airport in São Paulo and Galeão International Airport in Rio de Janeiro.

The network maps of both Guarulhos and Galeão International Airports are shown below and it is easily identifiable that majority of the air traffic takes place within Brazil and South America. There are considerably more international routes from São Paulo compared to Rio de Janeiro. The majority of the international routes are located in North America and Europe and there are no direct flights to Asia. In 2016, there was a total of 109.6 million aviation passengers. With 88.7 million passengers flying domestically while 20.9 million flying internationally which shows that a 80% of the aviation market in Brazil takes place domestically.



Guarulhos airport route map



METHOD

Data Obtained

- Brazil GDP
- Number of air passengers

Data Calculated

- Brazil GDP growth
- Growth of air passengers

GDP and aviation travel data was obtained from 1960 till 2016. Using the same data, the growth rates were calculated for each category. The data was then plotted against its corresponding year. GDP growth and the rate of aviation passenger growth was calculated to identify if there was a relationship between both growth rates. Other factors taken into consideration but not researched into were the exchange rate of the Brazilian Real and fuel prices. A factor that would have been interesting to look into would be the load factor. However, such data is not available.

RESULTS

GDP vs Number of air passengers

The logarithm of the GDP and number of air passengers were used in order to scale the numbers down and make a graphical comparison between both categories. As can be seen from the chart above, both charts generally have a similar shape and both the GDP and air travel has grown gradually since the 1960s. During periods of slow or negative growth, there is evidence that the number of passengers stagnates or decreases as seen in the periods between 1980-1985, 1990-1995, 2002-2003 and in 2016. This does give evidence that the GDP has a relationship on the number of aviation passengers. The gap between the logarithmic values also stays relatively constant between the two sets of data. The difference between both values range from between 4.09 and 4.59 which again shows evidence of a relationship between the two sets of data.

GDP growth vs Growth of air passengers

Similarly, there is a similar general trend between both the growth rates of Brazil's GDP and the growth rate of air passengers in Brazil. The trends are also more easily identifiable in this chart. From the chart, we can conclude that the growth rate for air travel is generally much larger in magnitude compared to the growth rate of the GDP. Generally, a growth in the GDP would usually result in a growth in air travel. However, there are certain years where there is significantly more growth in air travel compared to GDP growth such as the years 1973, 1986, 1997 and 2008. This also applies for negative growth in GDP and it will also result in negative growth in air travel. This can be evidence in the year 1992, 2003 and 2016. Using the evidence in the chart, it can be concluded that there is a relationship between the growth of Brazil's GDP and the growth of the number of aviation passengers.

CONCLUSIONS

According to the research and data from this project, there is sufficient evidence that there is a relationship between the GDP and the number of aviation passengers. An increase in the GDP will likely lead to a growth in the aviation industry. This is a fairly reasonable conclusion as a strong economy will result in more travel for both business and leisure and thus will result in a strong aviation industry. Due to the recent political turmoil, Brazil's GDP has had negative growth and therefore the number of aviation passengers has also been decreasing. It is likely to continue into 2018 as there the economy is very uncertain due to it being an election year.

However, there are many positive indications that will allow for the growth of the travel industry in Brazil in the near future. The oil and gas industry is a major part of Rio de Janeiro's economy and has been especially hit hard by the low oil prices. However, as the sector recovers, it will bode well for the country's GDP. Another factor that will boost the aviation industry is an OpenSkies agreement that should soon be signed with the United States. An OpenSkies agreement will allow unlimited flights between both countries and will be beneficial to both countries and the aviation industry in Brazil.

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