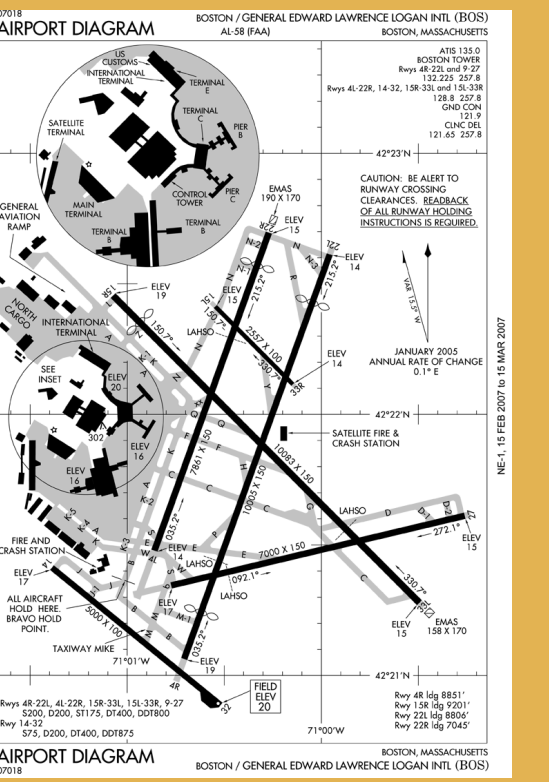


# Has Boston's air passenger traffic grown in the past decade?

Yi Zuo

Department of Biostatistics, Vanderbilt University



## Background

- Boston Logan Airport (IATA: BOS, ICAO: KBOS, FAA LID: BOS), is located mostly in East Boston, Massachusetts, United States.
- BOS ranks 16<sup>th</sup> busiest airport in the U.S. by total passenger traffic.
- The airport saw 40,941,925 passengers in 2018, the most in its history.
- It is of interest whether the air passenger traffic in Boston rises over the past decade, what contribute to the growth, and factors associated with the growth.
- Time series and normalized cross correlation have been used for aviation data.<sup>1-5</sup>

## Methods

### Data collection

- Passengers and flights data: Boston Logan Airport official website.
- GDP per capita of Boston Metro Area data: [opendatane트워크](https://www.opendatane트워크.com)
- Unemployment data: U.S. Bureau of Labor Statistics.
- International students data: Boston University International Students & Scholars Office.

### Number of passengers and flights by month

- Stacked area charts
  - Total passengers traffic = domestic traffic + international traffic + general aviation traffic.
  - Average Annual Percent Change (AAPC) was calculated for each component.
- Seasonality decomposition
  - Decomposed into underlying trend, regular seasonal pattern, and all the randomness left.
  - P-trend was calculated using Spearman test.
- Proportion of domestic, international, and general aviation travel
  - Infographics were used to present the change in proportions of domestic, international, and general aviation travel at BOS.

### Number of passengers per flight by month

The number of passengers per flight was calculated by month in each category of traffic.

### Factor associated with the increase in BOS traffic

Normalized cross correlation coefficients were calculated between the number of total passengers and the following factors.

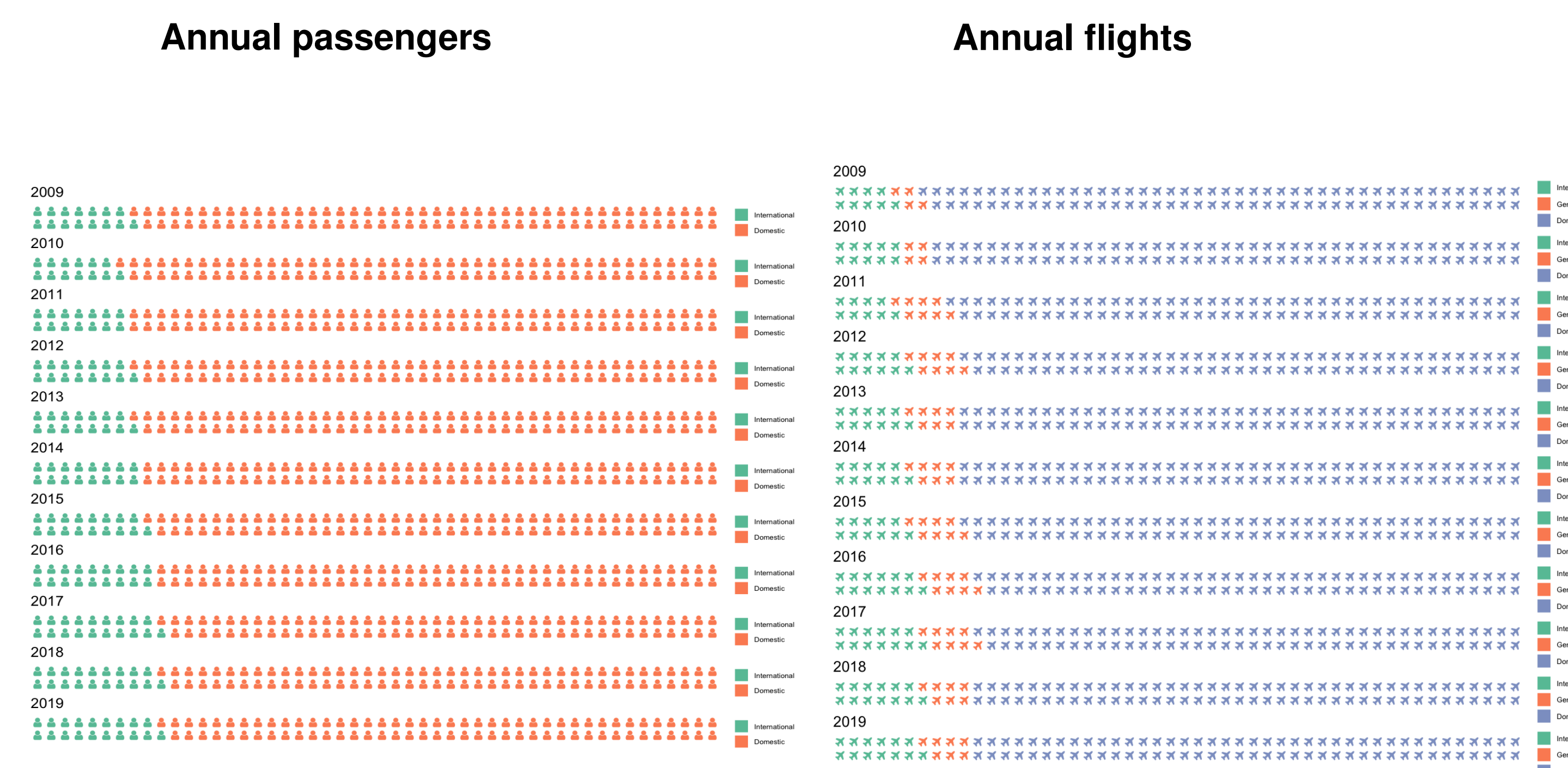
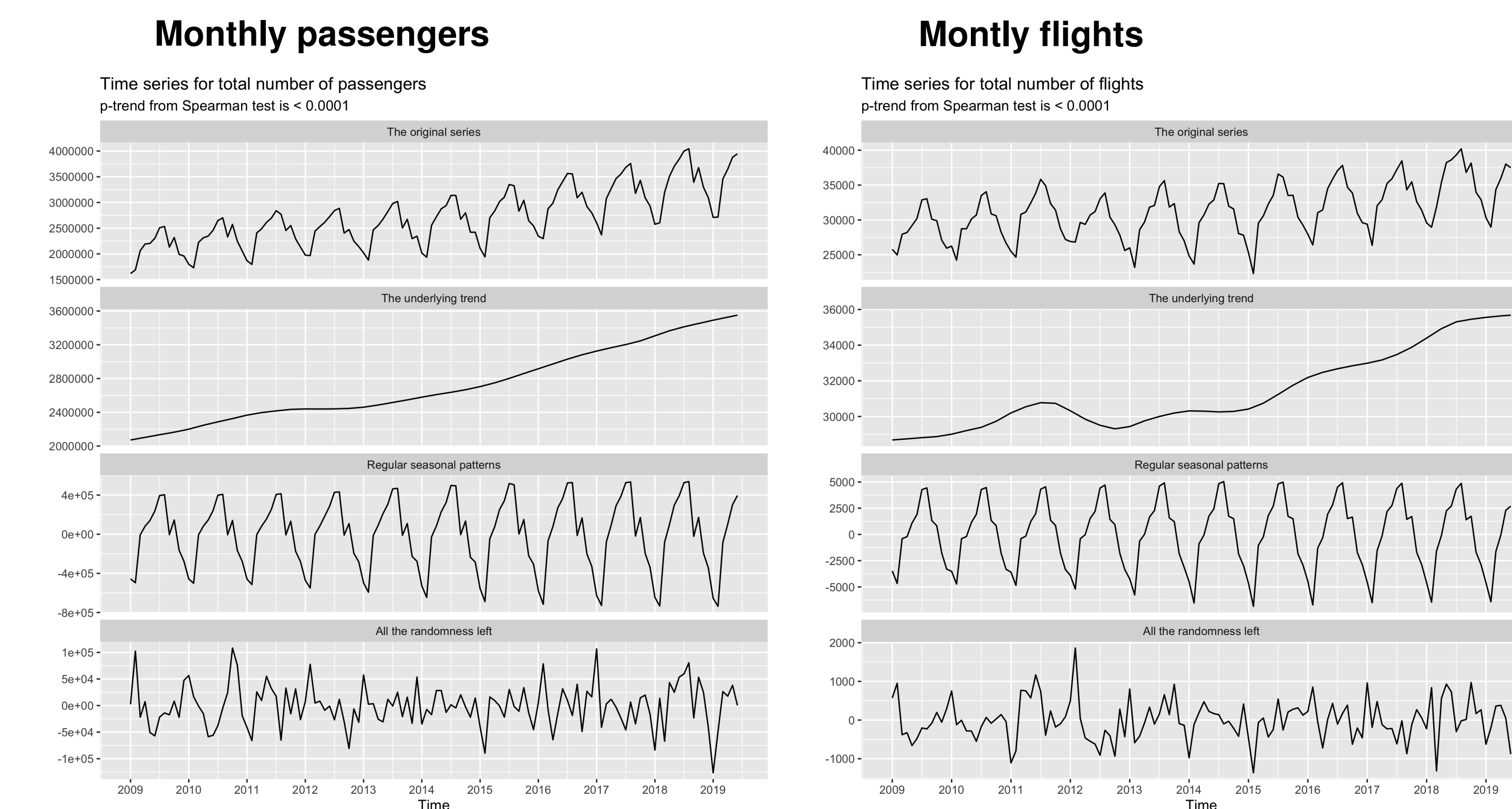
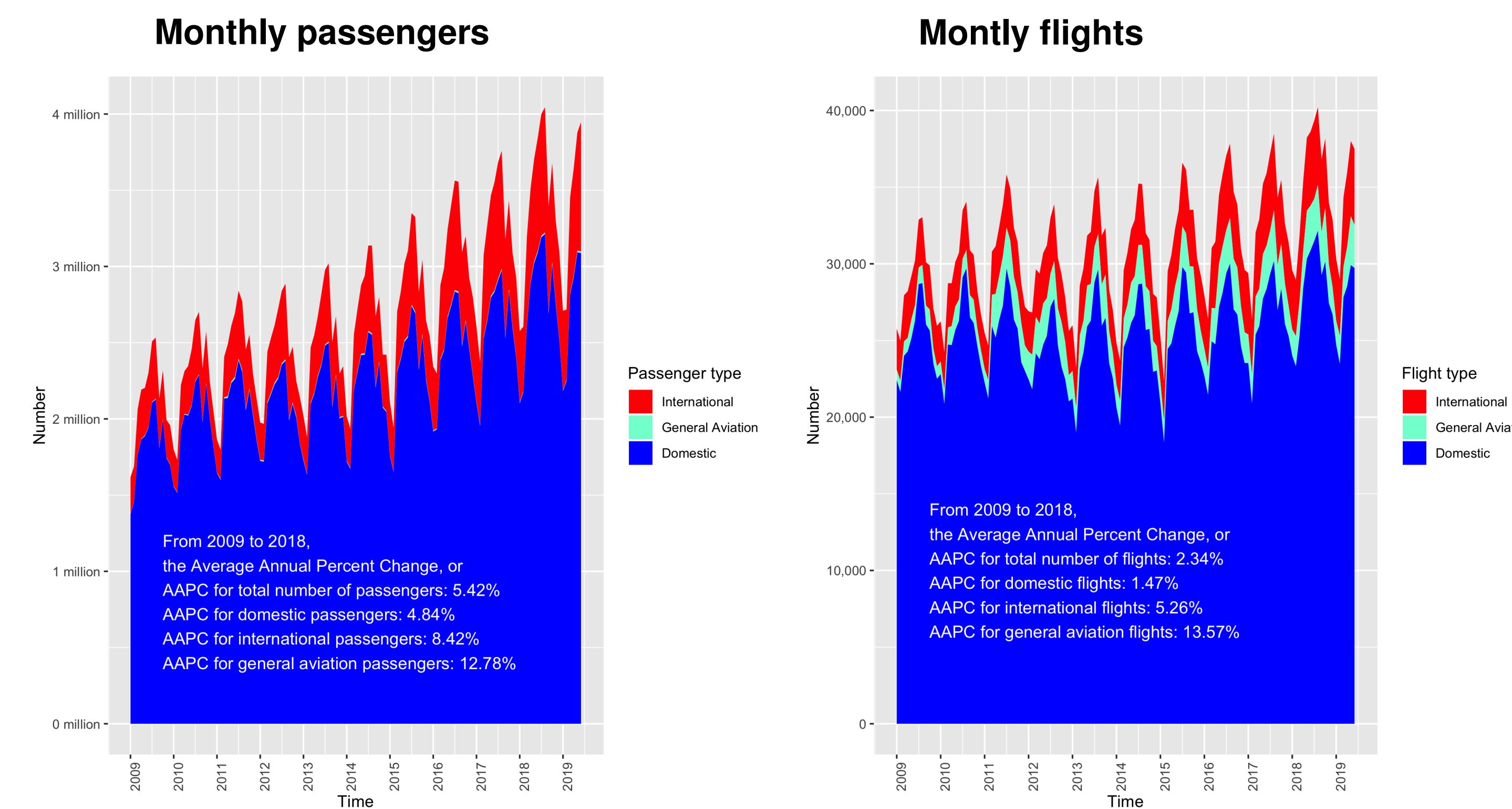
- GDP per capita of Boston Metro Area
- Unemployment rate in Boston-Cambridge-Quincy area
- Number of international students and scholars at Boston University

## References

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## Results

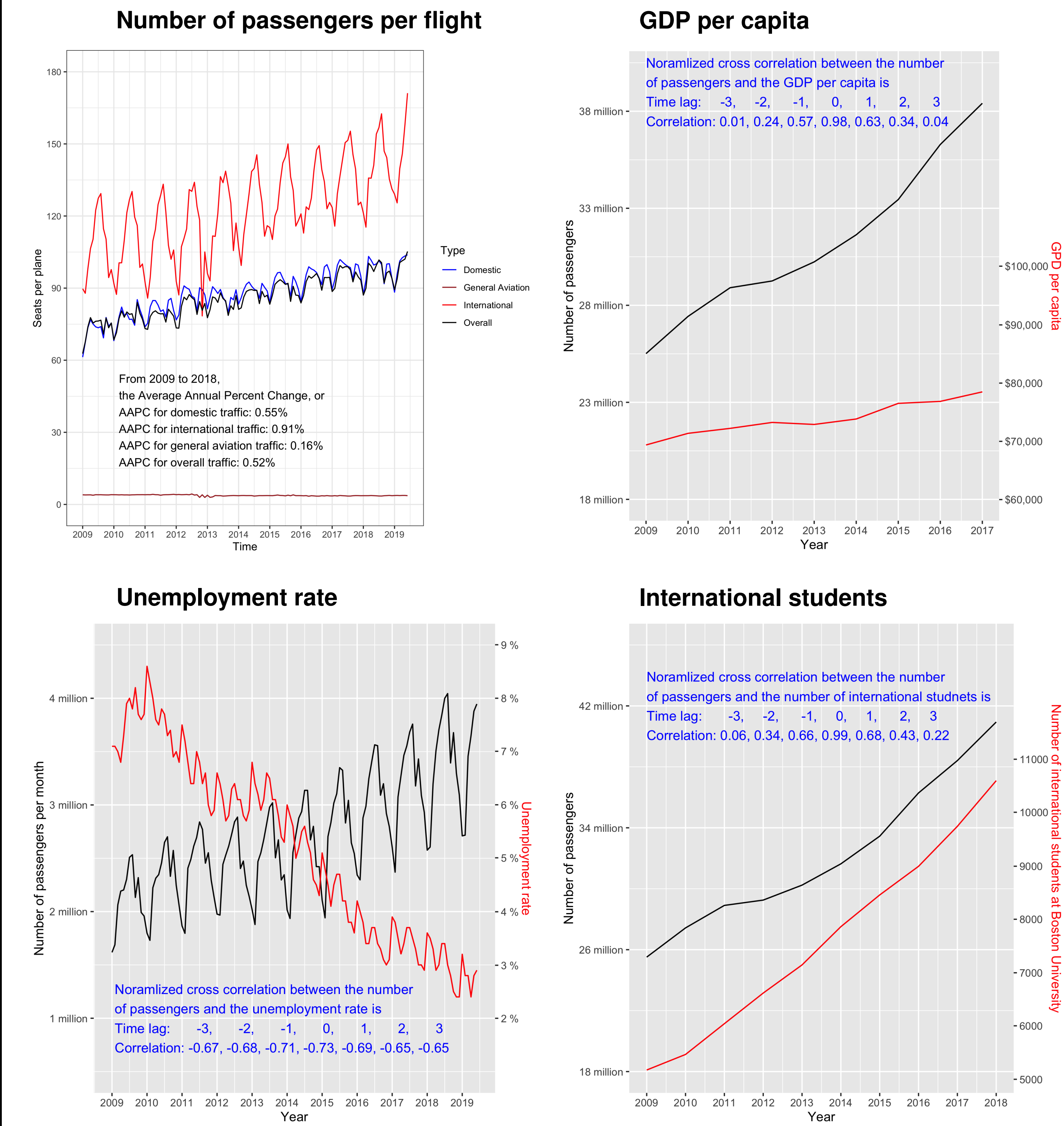
### Number of passengers and flights by month



### Number of passengers per flight

Please see below the plot in the upper left corner for details.

### Factor associated with the increase in BOS traffic



## Conclusion

- Air passenger traffic trend
  - Over the past decade, Boston Logan Airport saw steady increase in total number of passengers and flights. The Average Annual Percent Change (AAPC) for the total passengers was 5.42%, and the AAPC for total number of flights was 2.34%. Both increases were statistically significant.
  - Domestic and international traffic made up the majority of the total traffic, and both types of traffic increased greatly over the years. The proportion of international passengers and flights rose slightly.
  - The number of passengers per flight had an average of 1% annual growth on international traffic, which could be due to the rising demand for business travel and the fact that airlines started to use airplanes with bigger capacity to serve the Boston market.
- Factors associated with the growth in air passenger traffic
  - The strong economics performance in terms of increasing GDP per capita and decreasing unemployment rate supported the continuing growth in air passenger traffic.
  - The booming number of international students and scholars stimulated both domestic and international travel in Boston.