

STA 210 Project Proposal: A Study of Airfares in the Top 1000 U.S. City-Pair Markets

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2026-02-21

Section 1: Introduction

What determines how much you pay for a plane ticket? When we drive from Point A to Point B, calculating cost is relatively straightforward: adding the depreciation value of the vehicle, the time-value of the drive time, and the cost of gas gives us a basically accurate estimate of how much the trip will cost in a car. Airfares, however, can vary wildly and independent from the distance traveled.

For instance, one can fly from New Haven, CT to Tampa, FL for a distance of 1067 miles for just an average fare of 103 US Dollars (in Q4, 2024 - see `data/airfare.csv`), while a flight of 226 miles from Atlanta, GA to Charlotte, NC has an average fare of 309.22 US Dollars in Q4, 2024.

One explanation of this disparity in pricing is that on routes with little to no competitions, individual airlines are able to inflate pricing for nonstop flights without a significant drop in demand. As there are significant capital costs and slot constraints to opening new flight routes, it can be difficult to introduce more competition to particular routes with relatively lower demand. Testing this hypothesis, Brueckner et al. 2013, using the adjacent-airport approach, shows that while low-cost carrier competition can create dramatic fare impacts, competition between legacy carriers have limited impacts on airfares.

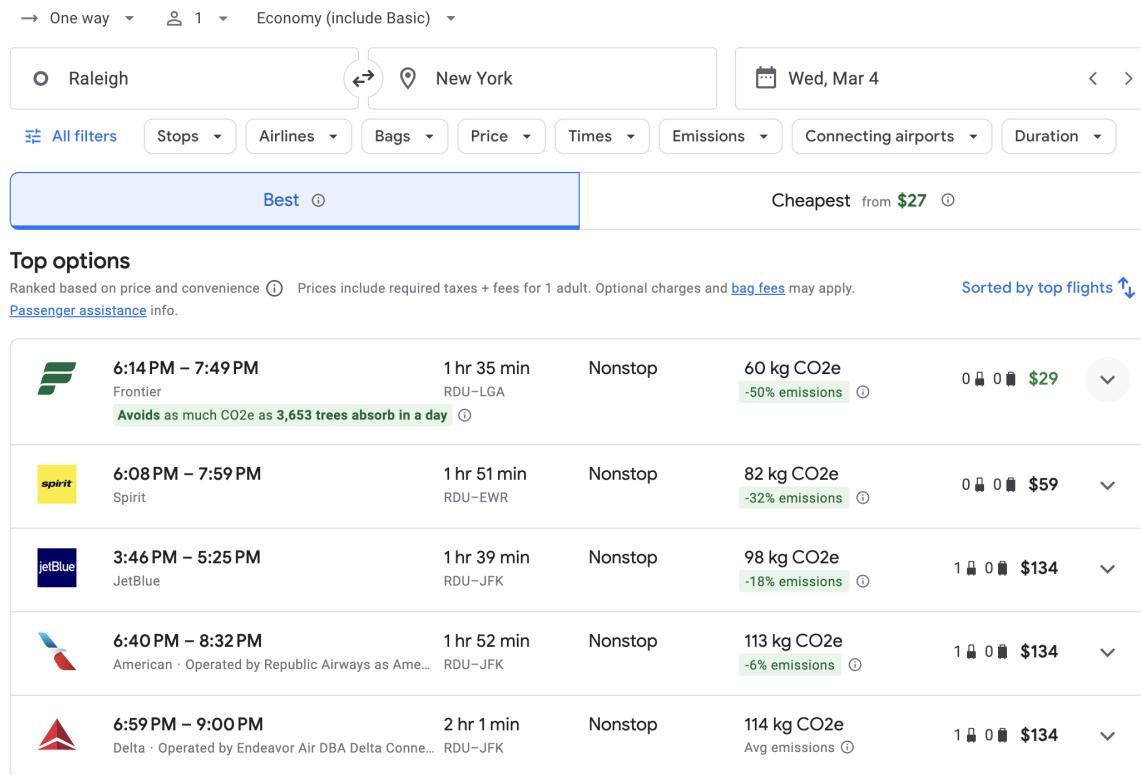


Figure 1: Airfares for Raleigh-Durham to New York City flights on Mar 4, 2026, accessed Feb 21, 2026

In this analysis, I ask two questions:

1. How have airfare pricing in U.S. domestic flights changed between 2019 and 2024?
2. What factors predict average fares in U.S. domestic flights?

Section 2: Data Description

Section 3: Data Processing

- Inflation adjusting for 2019 and 2024
 - https://www.bls.gov/data/inflation_calculator.htm CPI calculator, 100 USD in Sep 2019 = 122.8 USD in Sep 2024
- Adding categorical variable for type of carrier

Table 1: Airfare for Top 1,000 City Market Pairs in the Contiguous United States (Inflation-Adjusted 2024 USD)

Mean	SD	Min	P25	Median	P75	Max
247.16	64.99	82.94	199.64	237.18	288.91	551.97

Table 2: Airfare for Top 1,000 City Market Pairs in the Contiguous United States by timeframe (Inflation-Adjusted 2024 USD)

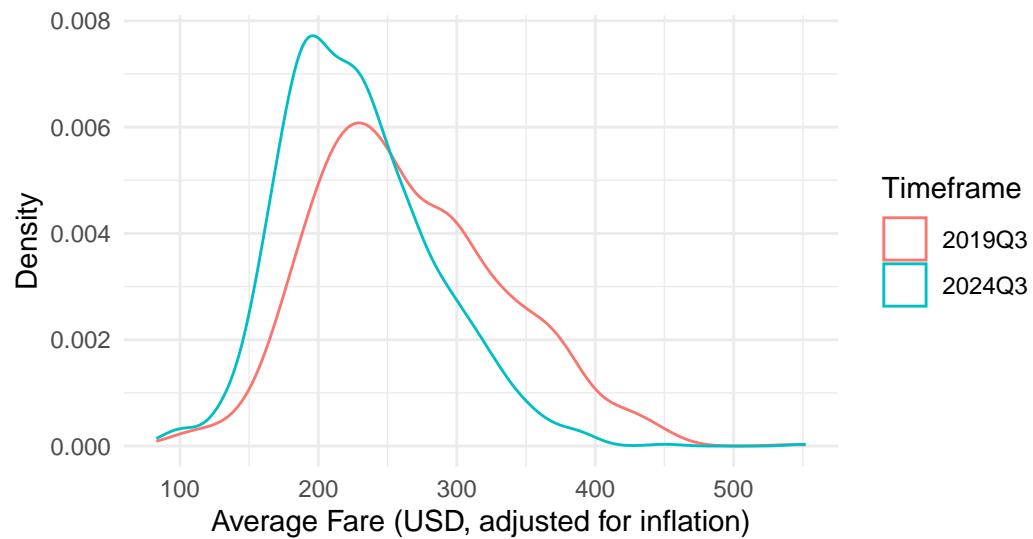
Timeframe	Mean	SD	Min	P25	Median	P75	Max
2019Q3	265.89	68.77	92.38	215.06	256.32	311.57	542.06
2024Q3	228.41	54.94	82.94	189.34	222.38	261.17	551.97

Table 3: Airfare Summary Statistics for Top 1,000 City Market Pairs in the Contiguous United States by distance (Inflation-Adjusted 2024 USD)

Distance (miles)	Mean	SD	Min	P25	Median	P75	Max
<500	214.43	47.14	92.38	183.54	208.14	239.09	422.44
501–1000	223.06	51.83	82.94	186.29	219.40	252.47	420.45
1001–1500	244.73	54.26	102.57	205.87	235.53	275.58	422.84
1501–2000	296.03	55.20	193.60	257.20	289.63	331.84	551.97
2001–2500	331.12	50.82	220.29	295.69	326.38	370.31	450.66
2500+	357.47	52.78	267.88	325.21	354.76	394.89	456.14

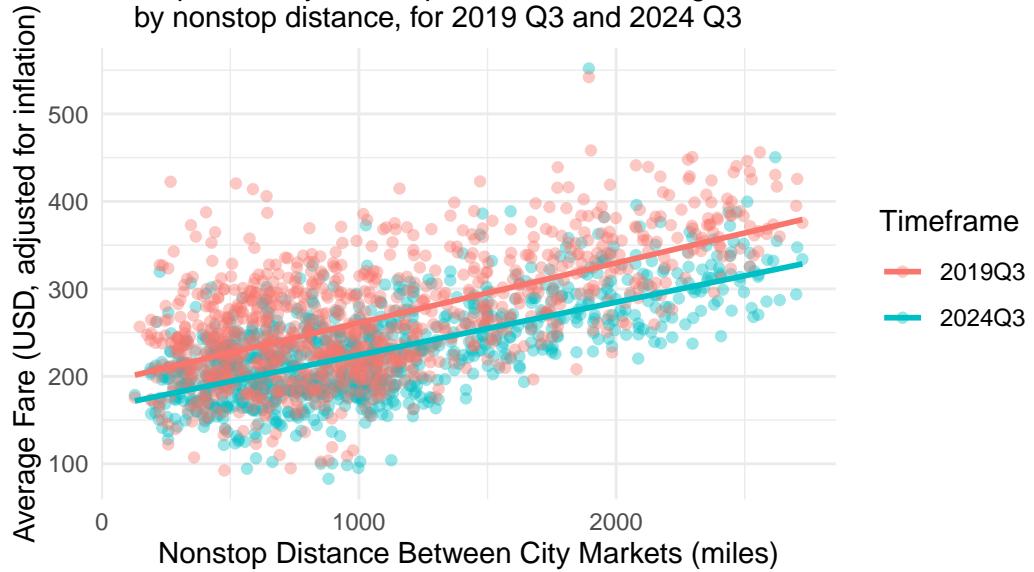
Distribution of U.S. domestic airfares for nonstop flights

For top 1000 city market pairs within the contiguous 48 states,
for 2019 Q3 and 2024 Q3

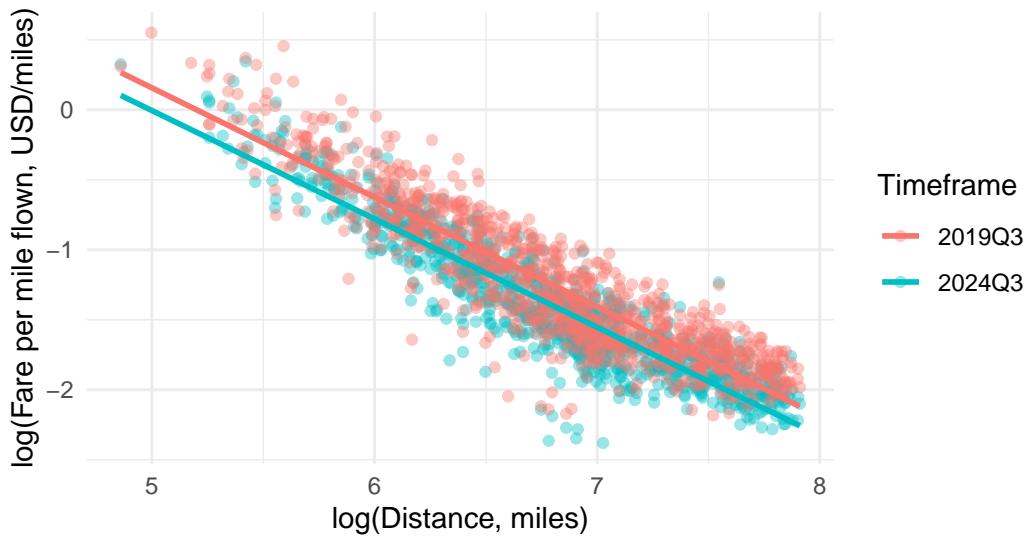


Distribution of U.S. domestic airfares for nonstop flights

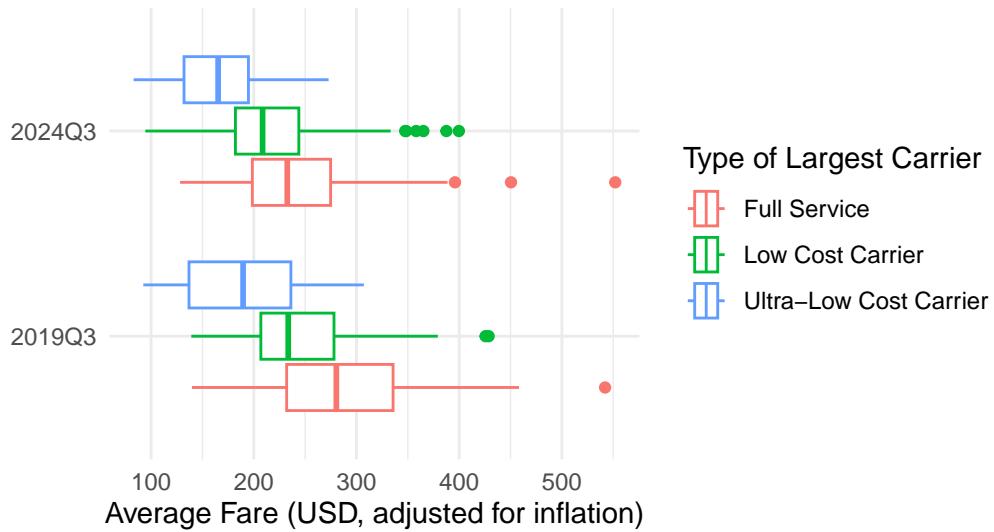
For top 1000 city market pairs within the contiguous 48 states,
by nonstop distance, for 2019 Q3 and 2024 Q3



Distance Elasticity of U.S. Domestic Airfare
 For top 1000 city market pairs within the contiguous 48 states
 in 2019 Q3 and 2024 Q3



Distribution of U.S. Airfare by Route's Largest Operating Ca
 For top 1000 city market pairs within the contiguous 48 states,
 in 2019 Q3 and 2024 Q3



Section 4: Analysis Approach