Tourism Signal Check: Do Visitors and Spending Move Together?

Course: EPPS 6356 - Data Visualization

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Abstract

Media stories often claim that U.S. tourism is seeing "crowds without cash"—busy destinations but softer spending. We test this idea ("the paradox") in California (CA) and Florida (FL) from 2019–2025 by pairing (a) visitor inflow via monthly air-passenger arrivals through major gateway airports (BTS T-100) and (b) inflation-adjusted spending via lodging/tourism tax receipts deflated to constant 2019 dollars (CPI-U). We build monthly indices (2019=100), compute spending-per-visitor (SPV) and YoY%, and visualize co-movement.

Our main hypothesis is no paradox: once obvious data errors are cleaned and travel mix (domestic vs. international) is recognized, spending should move with visitors. Preliminary Florida results support this—after fixing a handful of county reporting spikes, visitors and spending track closely. California's SPV is shown as a placeholder pending integration of monthly city/county series to replace the current fiscal-year allocation.

Deliverables are a clear figure pack and a short narrative that a non-technical audience can follow.

Introduction & Motivation

Why does this question matter? If visitors and spending truly decouple, tourism planners need different playbooks for pricing, staffing, and marketing. If the "paradox" is mostly a measurement artifact—caused by inflation baselines, data entry mistakes, or a temporary shift from international to domestic travelers—then our usual indicators still work. Either way, the exercise teaches solid, transparent habits for working with imperfect administrative data.

Literature & Context

The global tourism market has demonstrated a remarkable rebound in the wake of successive shocks over the past decade, most notably the COVID-19 pandemic. By 2024, international tourism had nearly fully recovered, with arrivals in Europe, the Middle East, and Africa surpassing pre-pandemic levels, while the Americas approached full recovery and Asia and the Pacific trailed slightly behind (UN Tourism Staff, 2025). Forecasts projected further growth of 3–5% in 2025 if favorable market conditions remained stable. These forecasts may be disrupted by the ongoing trade war in 2025. This recovery has been reflected not only in visitor numbers but also in tourism spending, which reached a record USD 1.9 trillion in 2024. Despite the sector's resurgence, ongoing structural challenges continue to constrain sustainable recovery. Tourism businesses face labor shortages, inflationary pressures, and rising costs for transportation, accommodation, and hospitality services, limiting operational flexibility (OECD, 2024). In addition, climate-related events such as wildfires, floods, and heatwaves, and other environmental disruptions contribute to volatility in tourism demand, alongside geopolitical tensions. (Papagianni et al., 2023).

Tourism's sensitivity to geopolitical and security risks further complicates the landscape. Travelers are risk-averse, making decisions based on perceptions of destination safety, health, and political stability (Sampaio et al., 2024). Therefore, effective multi-level governance, coordinated across national, regional, and municipal levels, has become critical to forging and maintaining a resilient tourism system. Good governance is directly relevant to interpreting divergences between visitor arrivals and spending patterns. This is particularly important when dealing with unforeseen conflicts and/or disasters. Outside of the pandemic, historical cases include the Arab Spring, the 9/11 attacks, SARS, and the Indian Ocean tsunami. redirecting travelers to destinations perceived as safer or more stable, thereby influencing regional demand patterns (Papagianni et al., 2023).

Research Questions & Hypotheses

RQ1. Do inflation-adjusted spending indices co-move with visitor inflow indices (monthly, 2019–2025) in CA and FL?

H_0 (No Paradox). After data cleaning and basic composition controls, visitors and spending move together (high correlation; similar turning points).

H_1 (Paradox Windows). There exist sustained (≥6 months) or segment-specific periods where they diverge.

Data & Scope

Geography/Frequency. CA and FL; monthly, 2019–latest.

Visitor inflow (monthly): U.S. DOT BTS T-100 (International Segment; Domestic Market).

- FL gateways: MIA, MCO, FLL, TPA, RSW

- CA gateways: Core-4 (LAX, SFO, SAN, SJC); sensitivity adds OAK, SNA

Spending proxy (monthly). City/county/state lodging/occupancy taxes (TOT/TDT).

- Florida: County-level Tourist Development Tax → rolled up to state.

- California: Temporary monthly allocation from state fiscal-year totals (will be replaced by monthly city/county series such as SF, LA, and SD).

Inflation: BLS CPI-U (U.S. city average), 2019 annual mean as base (2019=100).

Data hygiene. Separate /data_raw and /data; docs/qc_notes.md logs all assumptions and replacements.

Methods

Construction.

- Inflow index (2019=100): aggregate inbound passengers by state×flow (Dom/Intl); index by 2019 mean.

- Spending index (2019=100): clean administrative receipts (drop TOTALS/YTD; cap outliers with county×month seasonal medians), deflate to real dollars, and index by 2019 mean.

- SPV & YoY: SPV = real spending ÷ passengers; analyze YoY % from mid-2021 onward.

Robustness.

- Gateways: CA Core-4 vs. Core-6.

- Series: substitute CA monthly when available; annotate rate changes.

- Composition: plot Dom/Intl alongside spending to attribute differences.

Co-movement tests.

- Pearson r (2019→latest; and rolling 12-month r).

- Slope comparison across sub-periods (pre-pandemic, recovery, 2024–2025).

- Visual inspection: parallelism and turning points.

Visualization standards. Color-blind palette: domestic blue, international teal, and spending dashed orange; end labels on solid lines; compact legend for dashed series; captions list sources/deflation/base year; outputs as 1920×1080 PNG.
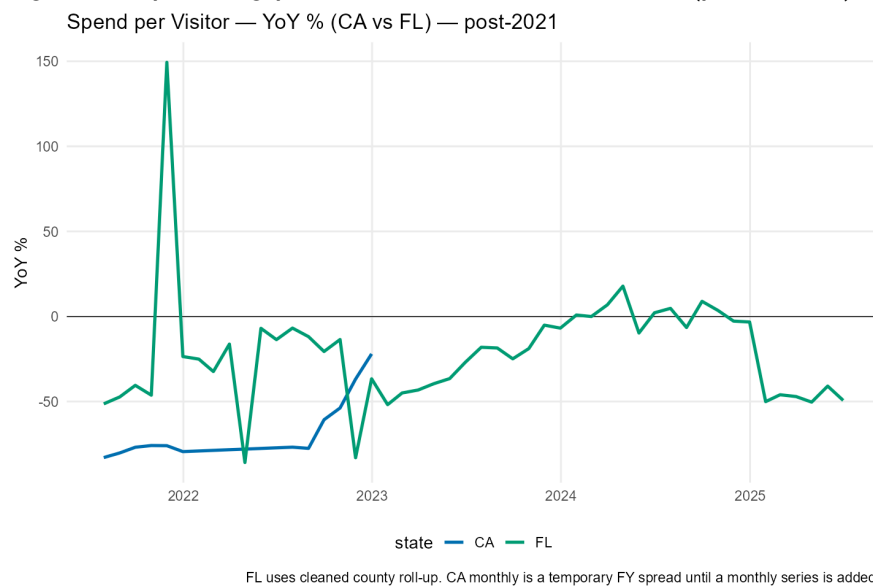
Preliminary Results (Florida)

Figure 1. Florida — Visitors vs Spending (2019=100), cleaned
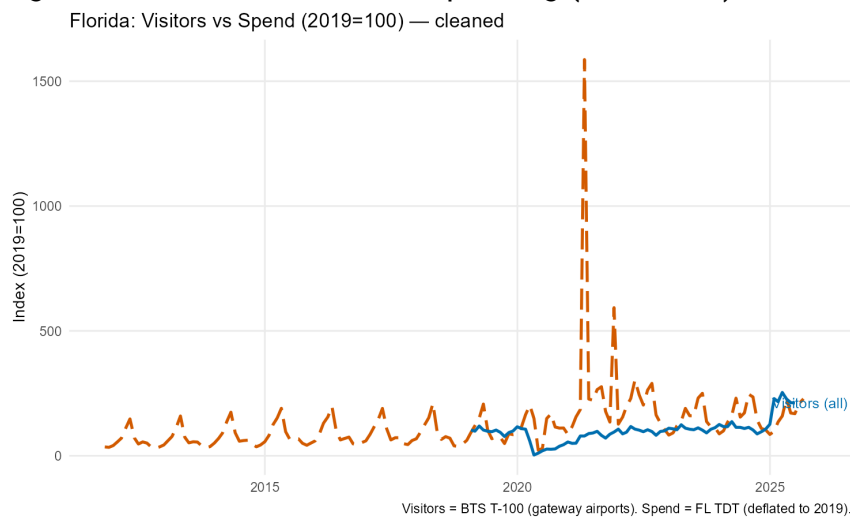
After outlier fixes, spending tracks visitors: COVID collapse in 2020, steady recovery through 2022–2024, and modest cooling in 2025. This supports H_0 (no paradox).

Figure 2. Spending-per-Visitor YoY % — CA vs FL (post-2021)

Florida SPV YoY stabilizes near 0% after 2021, consistent with normalization. California's SPV line is **provisional** (FY allocation) and will be re-estimated with monthly city/county data.

Expected Findings

Preliminary results for Florida suggest that the observed relationship between visitor inflows and spending contradicts recent media narratives of "crowds without cash." After data cleaning and adjustment for composition effects, visitor traffic and tourism spending move largely in parallel, both recovering steadily relative to 2019 benchmarks. The modest softening observed in 2025 appears to represent a short-term fluctuation rather than structural decoupling, with overall tourism revenues remaining above pre-pandemic levels.

For California, we expect a similar pattern of co-movement once the monthly spending series is fully integrated. Given California's larger and more diversified tourism base, higher average spending is anticipated to offset any remaining weakness in inbound international traffic. If time and data availability permit, the analysis will be extended beyond the United States to include selected international destinations such as Paris, France. This comparative expansion would allow assessment of whether the observed spending–visitor dynamics hold in different institutional and market contexts, thereby enhancing the generalizability of our findings.

Overall, the results are expected to support the null hypothesis (H_0): there is no paradox between visitor volume and spending when data are properly cleaned, deflated, and composition-adjusted. Apparent discrepancies reported in popular discourse likely reflect measurement artifacts rather than true economic divergence.

- Overall co-movement: After cleaning, visitors and spending move together in both states (correlation > ~0.7) with aligned turning points.

- Mix explains gaps: Periods where domestic recovered faster than international show temporary spending shortfalls relative to inflow—especially early 2021–2022.

- SPV normalization: By 2022–2025, SPV YoY hovers near zero; the small negative drift in 2025 likely reflects softer pricing or thriftier visitors.

- Robustness: Findings hold when adding CA's OAK and SNA gateways and when substituting monthly CA city series for the FY allocation.

Ethics, Risks, and Limitations

All data used were public aggregates; no personal identifying information was used. Taxes are reflective of rates and compliance. Known changes, when possible, will be annotated and/or triangulated. Project scope is limited by our measurement of incoming tourists to include only visitors via air travel. Tourists who traveled via rail or road were not consistently factored into travel data. The baseline index was expected to distort one year later due to the COVID-19 pandemic. Primary inference emphasizes post-2021 windows. No conflict of interest to report.

Expected Contributions

Academic

- A transparent, reproducible template for pairing inflow and spending using public administrative data, including a clear outlier policy and CPI-based deflation.

- Simple, readable visual diagnostics (indices + SPV) that generalize to other places and shocks.

Practical

- A reality check for the "crowds without cash" narrative: where co-movement holds, planners can rely on traditional indicators; where it doesn't, the figures flag when and why.

- A quick-start recipe cities and DMOs can reuse: which data, how to clean it, which charts to trust.

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