

Analysis Memo #2

Checkpoint 7

Mapping Global Growth — A Data-Driven Strategy for NFL Market Entry

Quick Reminder

This project examines which international markets offer the highest potential for sustainable NFL expansion by modeling and comparing countries using a composite Market Attractiveness Index and clustering analysis. The goal is to identify where the NFL can most effectively invest in games, media rights, and fan development. This matters now as the league accelerates its global growth strategy and faces increasing competition for international audiences.

Data Used

The project is based on the cleaned country-level dataset from CP4 (merged_data), where each row represents a single country. Variables include Google Trends signals (to measure interest in the NFL), economic indicators (GDP per capita), demographics (urban population), stadium infrastructure, and aviation connectivity metrics.

As mentioned in CP6, some countries were dropped due to either:

1. Already hosting NFL games or
2. Not having complete information across all metrics

No further changes were made to the data.

CP6 Baseline

CP6 had a composite Market Attractiveness Index (MAI) as the baseline method, built by normalizing key variables and applying fixed, equally distributed weights. The headline result from this approach was a clear top-market separation, with the highest-ranked country scoring approximately 0.26 points higher than the bottom of the top-10 group (~78% difference), demonstrating that the baseline method produced meaningful, non-trivial differences between international markets rather than marginal noise.

The clustering produced 4 clusters:

- Clusters 0 and 2 are realistic candidates for regular-season international games.
- Cluster 3 could support preseason games, fan festivals, and broadcast-first strategies.
- Cluster 1 is better suited for revisiting further down the road.

Upgrades in CP7

1. Market Attractiveness Index

The focus was on testing different combinations of weights, depending on the rationale.

- Prioritizing fan interest, for a strategy that assumes that a strong fan base may drive ticket sales, merchandise, and local engagement faster than infrastructure or connectivity.
- Prioritizing infrastructure and economic readiness, for a strategy focused on markets with high GDP per capita that can support higher ticket prices, sponsorship, and media deals. Fan interest is still important, but revenue potential may outweigh raw engagement.

2. Clustering

The focus was on enhancing feature representation to improve clustering of international NFL markets. Specifically, an interaction feature between economic readiness and fan interest (`economic_readiness * fan_interest`) was added. This feature should capture markets that are both financially capable and have strong fan engagement.

DBSCAN, a density-based clustering method, to better handle outliers and potentially uncover irregularly shaped clusters, was also tested. DBSCAN identified 2 core clusters and 24 noise points, the and the silhouette score only improved slightly from 0.285 (K-Means without interaction) to 0.298. This suggests that although DBSCAN can detect outliers, the overall market separations remain fuzzy, and the primary limitation is the feature representation rather than the clustering method.

The interaction feature emphasizes countries where both fan interest and economic readiness are high, slightly improving cluster separation (K-Means silhouette increased to 0.319), aligned with findings on CP5 EDA on the relationship between fan engagement and economic variables.

Analysis Spec

Field	Description
Outcome	Market Attractiveness Index (MAI) and cluster assignment

Inputs	<ul style="list-style-type: none">- Fan interest (fan_col)- Economic readiness (economic_readiness)- Infrastructure readiness (infrastructure_readiness)- Connectivity (connectivity_index)- New: Interaction feature (economic_readiness * fan_interest)
Sample	All countries in dataset with complete values for the input features
Row Definition	Each row = one country
Formula / Rule	MAI = weighted sum of standardized features (weights vary by scenario) K-Means / DBSCAN = cluster assignment based on standardized features
Expected Direction for New Input	Countries with both high fan interest and high economic readiness should have higher MAI and be more likely in top clusters. The interaction emphasizes countries that are strong on both dimensions, not just one.

Results and Comparison

- The interaction feature (economic_readiness * fan_interest) increased the K-Means silhouette score from 0.285 to 0.319, indicating a modest improvement in cluster separation.
- DBSCAN clustering showed a very slight improvement.
- Weighting scenarios in MAI: Across equal, fan-prioritized, and econ/infrastructure-prioritized MAI, the interaction feature ensures that top countries (e.g., Canada, Australia, Mexico) remain highly ranked. This demonstrates a certain stability across different strategic weightings.

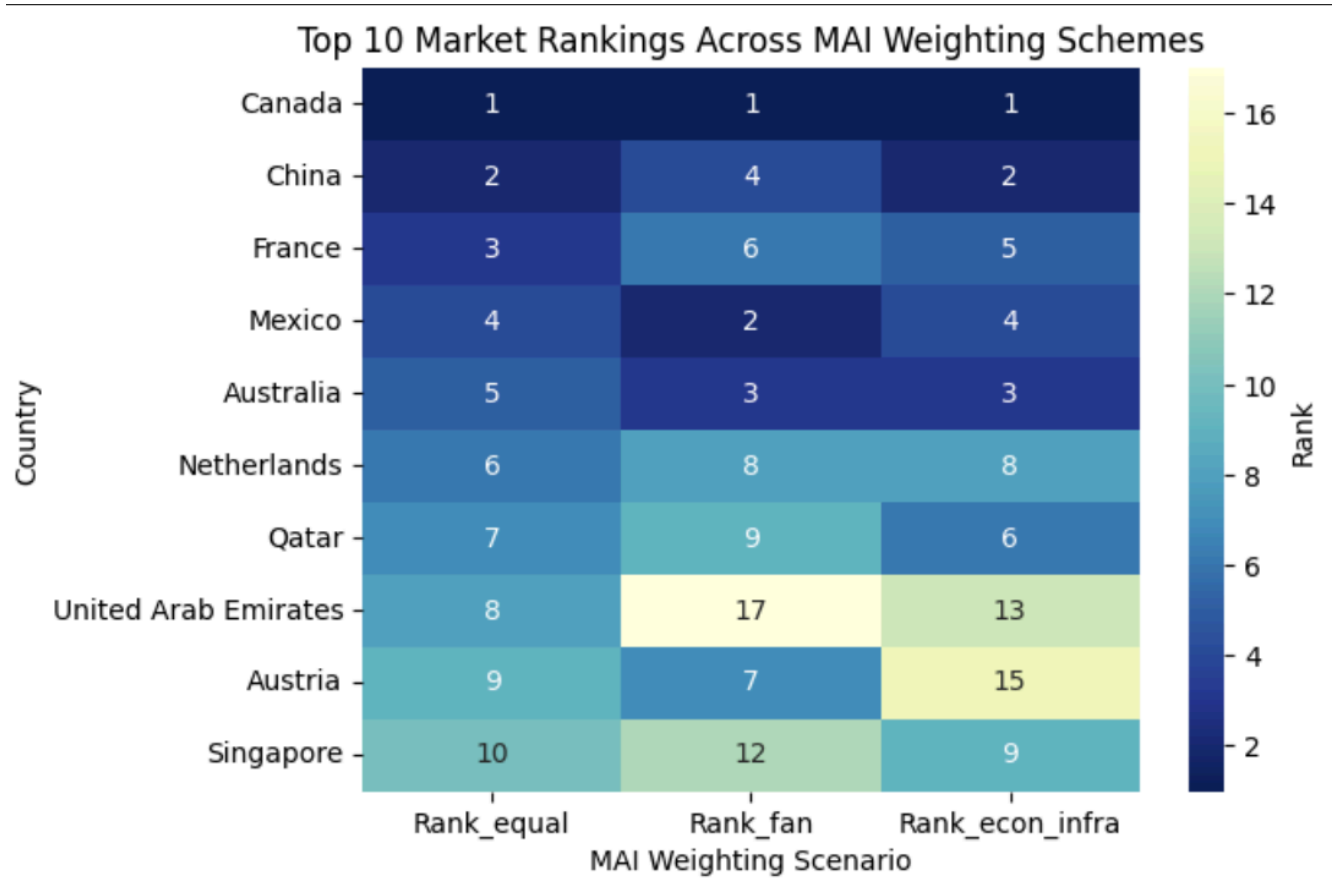


Fig 1. Stability across different weightings - For MAI-based selection, the top 10–15 countries remain relatively stable across scenarios.

Interpretation

Adding the interaction between economic readiness and fan interest emphasizes countries that are strong on both dimensions, rather than just one. However, all in all, the clustering is still fuzzy and additional features would be needed to improve it (e.g., data on NFL games audiences, historical event attendance)

Markets like Canada, Australia, and Mexico are consistently top-ranked, meaning they are most attractive for NFL expansion. Countries with lower combined fan/economic strength drop in priority, even if one metric is high.

Strategic planners, league executives, or international market teams can use these insights to prioritize marketing, broadcasting, and expansion investments in countries with the greatest potential. This allows focused resource allocation and reduces the risk of entering markets that look attractive on a single metric but are less feasible overall. Their analysis can be enriched with private data, such as NFL broadcasting data.

Limitations

- Fan interest, economic readiness, infrastructure, and connectivity metrics may be thin or estimated for some emerging markets.
- Missing data or low-quality proxies could distort MAI or clustering results for these countries.
- Cultural factors and regulatory constraints are not captured, so rankings may overstate attractiveness for some markets

Next Steps

- Consolidate top 10–15 markets with clear rationale for ranking, highlighting which are robust across weighting scenarios.
- Include simple visuals: PCA plots, MAI heatmap, and cluster assignments for clarity to executives.