

RELATIONSHIPS IN THE EUROPEAN FOOTBALL MARKET

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INTRO

- **European football market is one of the world's most prolific markets (nearly \$8 billion in transactions in 2023).**
- **It involves teams, players, and agents that facilitate transfers, balancing economic interests and career development.**
- **Final standings determine championship victory, entry into European competitions or relegation to a lower division.**
- **Dataset includes 82,382 transfers and 23 variables, covering transfers from 2009 to 2024.**
- **Additional processing: adding the name of agents and the generated capital gain.**

AIM

The analysis focuses on the relationships between clubs, the frequency and value of transactions, the role of agents, the impact on sporting outcomes, and the generation of capital gains, using graphs to visualize and infer information.

METHODS

Analysis was conducted using graphical and mathematical elaborations. The characteristics of the graphs were calculated using the following metrics:

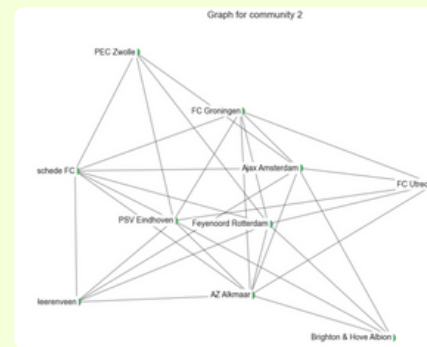
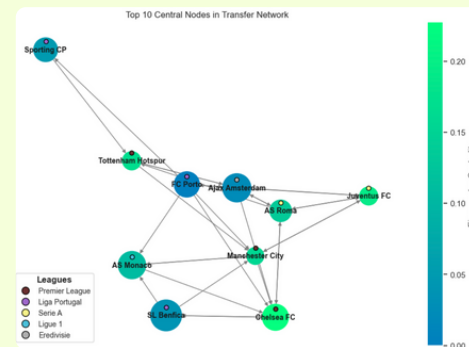
- Degree centrality
- Eigenvector centrality
- Clustering coefficient
- Transitivity
- Density
- Degree assortativity
- Louvain algorithm (community detection in the exchange network)
- Performance index - PRW (Point Rank Wins)

RESULTS



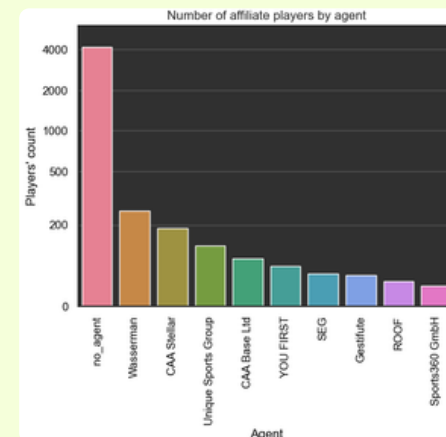
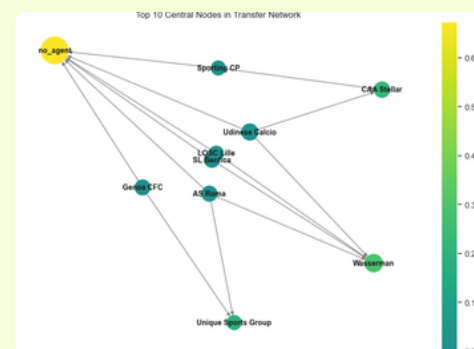
RELATIONSHIPS BETWEEN TEAMS IN TOP 7 EUROPEAN LEAGUES.

- **Metrics Used:** Degree centrality and eigenvector centrality.
- In terms of the total number of transactions, Italian teams are the most involved in transfers. When considering capital gains, Juventus, Roma, and Chelsea are among the most central clubs. Notable for producing young talents are Ajax, Benfica, and Sporting Lisbon.
- **Louvain algorithm:** Teams tend to negotiate with teams from the same nationality or those that are geographically and culturally closer.



RELATIONSHIPS BETWEEN TEAMS IN TOP 7 EUROPEAN LEAGUES AND AGENTS.

- Many players prefer to be represented by family members over agencies.
 - The most influential agencies are Wasserman, Unique Sports Group, and CAA Stellar.
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- | Agent | Number of players |
|---------------------|-------------------|
| Wasserman | 4000 |
| Unique Sports Group | 3500 |
| CAA Stellar | 3000 |



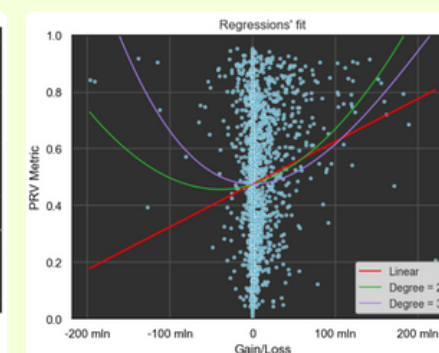
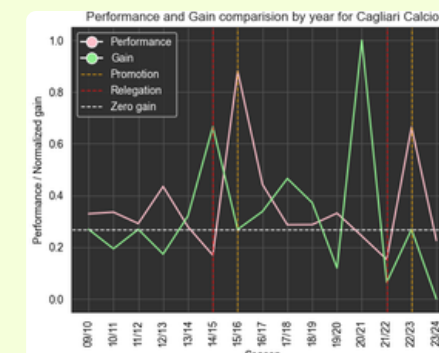
RELATIONSHIPS BETWEEN GLOBAL LEAGUES IN PLAYER TRANSFERS.

- **Purchases Graph (origin of players):** European nations are the main nodes. Paraguay is significant source for young talent circulation. Netherlands and Portugal are central in the purchase market as sources of players.
- **Sales Graph (destination of players):** USA: attracts players at the end of their careers with substantial financial offers in less prestigious leagues. Portugal and Spain are important leagues.
- **Flourishing internal trade in all leagues.**



RELATIONSHIP BETWEEN TEAMS' CAPITAL GAINS AND SPORTING RESULTS.

- Metric used: Performance Index PRW
- Graphical and linear and polynomial regressions analysis.
- No significant relationship between performance and capital gains for all teams.
- However, teams that generate substantial capital gains tend to achieve more notable results.
- The regression coefficients confirm the weakness of the observed relationship, with particularly low R^2 values even for the best model.



CONCLUSIONS

- Analysis conducted using graphs, linear and polynomial regressions
- Central nodes in the relationships: Chelsea, Juventus, Roma.
- Preference for geographically close relationships due to linguistic and cultural proximity.
- Influential agents: CAA Stellar, Unique Sports Group, Wasserman; preference for family representation.
- Central leagues: Portuguese and Spanish, important for talent creation and sporting results.
- Capital gains-performance relationship: Significant but with a low coefficient and low R^2 , indicating other influential variables.
- Analysis limitations: Lack of historical data on changes in agents, transactions and agents of retired players.

ACKNOWLEDGEMENTS

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