

A DECADE OF 1000 GOALS

CONSISTENCY IN CHAOS :
ANALYZING A DECADE OF
GOAL SCORING TRENDS



**APRIL
2025**

Prepared by
EMRE CIHANGIR

TABLE OF CONTENTS

| | |
|--|-------|
| INTRODUCTION | 3 |
| CHALLENGING THE MISCONCEPTIONS | 4 |
| CONTROVERSIAL TRANSFERMARKT VALIDATION | 5 |
| METHODOLOGY | 6 |
| DATA PROCESSING | 7 |
| MAJOR CHANGES IN FOOTBALL | 8 |
| BIG FIVE'S VISUALS | 9-13 |
| ANALYSIS | 14-20 |
| FUTURE RESEARCH | 21 |

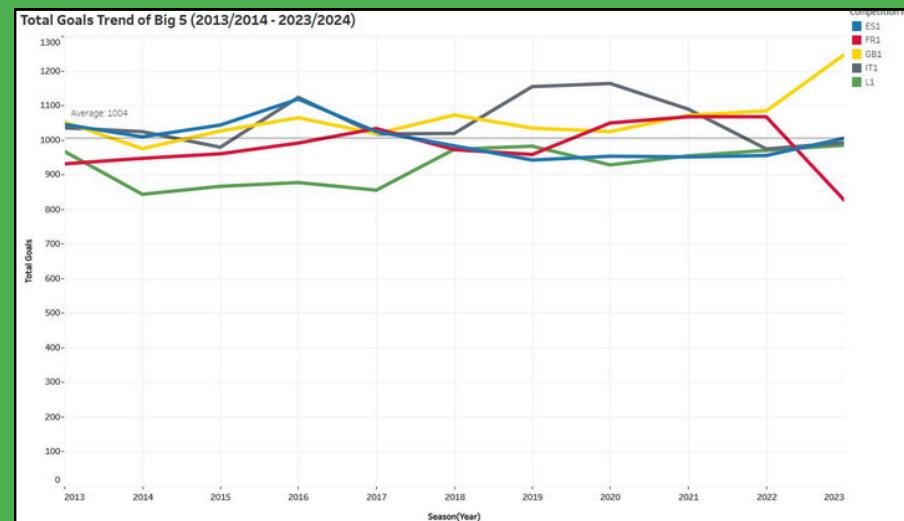
INTRODUCTION

Football is a sport that is always changing.

Over the past ten years, tactical innovations, rule changes, and technological advancements, such as the introduction of VAR, have had a significant impact on the game, which has been very arguable to this day and age. However, one thing has remained remarkably consistent: **the total number of goals scored across Europe's top five leagues** (Premier League, La Liga, Bundesliga, Serie A, and Ligue 1)

These leagues have averaged about 1000 goals per season from 2013–14 to 2023–24 (1004 to be exact).

Given how much football has changed due to player transfers, economic shifts, foreign ownership, and even rule changes, and is the goal-scoring so stable? Did scoring not change at all inexplicably or there are factors can help explain it?



La Liga's difference is among one of the key findings of this project. La Liga has seen a drop in total goals, while the other four leagues have seen a modest increase. Is this because players like **Messi** and **Ronaldo** have left? More stricter financial regulations? We can determine what distinguishes La Liga from the other leagues by looking at these patterns.

Contradictions and constants exist in the game of football. The 1000-goal marker may serve as a reminder that some things never change but looking at the dynamics underlying in this analysis, along with the irregularities that add to the game's appeal, will help us go through the decade!

WHAT THIS PROJECT EXPLORES?

This analysis aims to answer that question above. By examining major rule changes, player transfers, and economic factors, we seek to understand how they interact with goal-scoring trends.

2.65

Goals-Per-Game
across the top 5
leagues

\$30B≈

Total market value
of the top 5
leagues

0.48%

Yet, total goals' CAGR rate of
the decade looks little, why?



CHALLENGING THE MISCONCEPTIONS

- "Big Star Players are leaving = goal drought?"
- **Not really, the data will reveal many inconsistencies in the analysis.**
- "Economic growth = higher-scoring games?"
- **Some spendings increased as much as 265%, yet it didn't reflect in the goals as much.**
- "More penalties with VAR=more goals?"
- **No, the stats indicate net loss of goals!**

NEXT STEP!

How did I go about examining this data now that we went through the main parts of the project? My methodology, what I analyzed and how I evaluated the most major changes in football, is covered in the next sections, but first:

CONTROVERSIAL TRANSFERMARKT VALIDATION

* WHAT I DISCOVERED:

Because of differences in total goals and top scorers' goals between seasons, I decided not to use **Transfermarkt** statistics when I compared it with **official stats and Opta**.

I recently looked more into this gap more and discovered that own goals are not included in Transfermarkt's "Distribution Of Goals" data, which supposed to show the total goals scored by teams each season.

However, in the "Goal Distribution According To Type" page, you can see the official numbers of the total goals, without having the category of "own goals".

It is not the best idea because it is not like the opposition team scores own goals on purpose or without a given team's push and efforts against the opposition

Therefore, home+away goals should be calculated in the Transfermarket datasets.

* HOW I VERIFIED IT?

I checked the total goals on Transfermarkt([Goal Distribution According To Type" page](#)) against those from FBref and the official league sources.

I verified that the total goals matched by calculating (Sum of Team Goals) + (Own Goals).

* PREMIER LEAGUE 2017/2018 EXAMPLE

Team Goals **988**

Own Goals **30**

Total Goals **1018**

Based on **Transfermarkt** data:

- [Team Goals](#)
- [Own Goals](#)
- [Total Goals](#)

| Total: | 988 | 253 |
|--------|-----|-----|
| Total | 419 | 281 |

METHODOLOGY

* DATA COLLECTION: WHAT WAS ANALYZED?

Leagues Covered:

- Premier League (England)
- La Liga (Spain)
- Bundesliga (Germany)
- Serie A (Italy)
- Ligue 1 (France)

Seasons Analyzed:

- 2013/14 to 2023/24

* DATA SOURCES

- [Worldfootball.net](#)
- Official league statistics
- [Opta](#), [FBref](#), [The Analyst](#),
- [Transfermarkt](#)

* DATA VERIFICATION

I checked WorldFootball.net's data with official league sources and one of the most reliable football statistics providers, which is Opta, to confirm the total goals for each season in order to assure data accuracy and reliability:

Data was cross-checked with:

- Premier League: [The Analyst](#)(Opta based) and the [Premier League's official website](#).
- Ligue 1: [FBref Ligue 1 Stats](#)
- La Liga: [FBref La Liga Stats](#)
- Bundesliga: [Bundesliga's official website](#).
- Serie A: [FBref Serie A Stats](#)

How I Confirmed Accuracy?

- **Step 1:** The total goals per season on WorldFootball.net were compared to data from official league reports and leading statistics websites such as [FBref](#) and The Analyst, which are Opta-based, as well as Transfermarkt after verifying them.
- **Step 2:** Verified that the goal totals of each season matched across sources by doing random checks.

* WHY WORLDFOOTBALL.NET?

Across official sources, I found it to be the most convenient to use for the total goals and goals-per-game visuals.

Other Opta-based sources, such as FBref, were used to both to verify and get data insights about star player's statistics, which is Goal+Assist contribution seasonally.

DATA CLEANING

* WHY DATA CLEANING IS IMPORTANT?

Missing values, inconsistencies, and structural differences across sources are common in different datasets. As the goal of my project is to examine goal trends in Europe's top five leagues over the past ten years, maintaining data accuracy was crucial for the credibility of the findings as in any data project.

* DATA PROCESSING & CLEANING

I started by using **R** codes to determine the overall number of goals using Transfermarkt databases and visualize. When I compared the output with official statistics, I saw that there are big gaps every season. Later, I found that Transfermarkt did not include the own goals in team goals' total. Then I also confirmed this with running a different R code which was picking up the home and away goals(in each football game) and the numbers were correct, then.

Therefore, I had chosen to use league totals that were officially recorded rather than ones that were calculated using team-based goal statistics in order to prevent this inconsistency. The main source was **Worldfootball.net** and I manually collected from their websites, and created a dataset on **R** with codes, only to export and use it on **Tableau**.

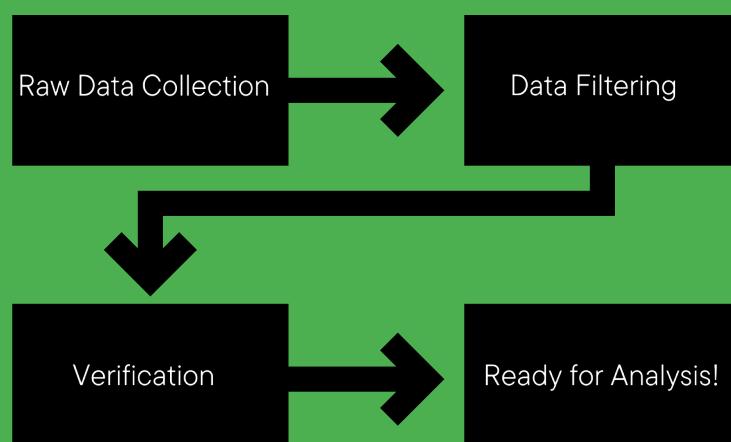
Lesson learned: Different datasets have different approaches to goal categorization!

Filtering The Data:

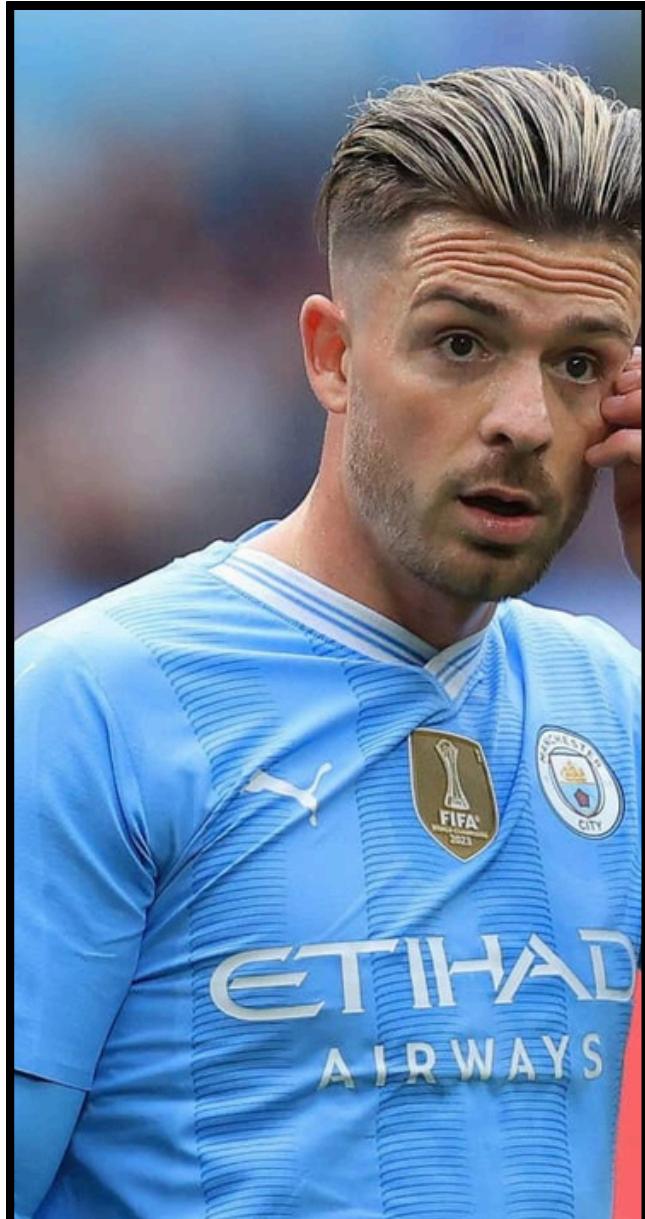
Only Premier League, La Liga, Bundesliga, Serie A, and Ligue 1 seasons were extracted.

I confirmed that the number of games played each season matched league formats. And to compare better with other leagues combined, I also created a dataset based on **goals-per-game**.

IMPORTANT TO NOTE: An adjustment was done due to the **canceled season of Ligue 1 (2019/2020) due to COVID-19**. Based on the goals per game for that season, I re-calculated and completed the rest of the season. It was done for the consistency and analysis of the data, for not being manipulative.



MAJOR CHANGES IN FOOTBALL



MAJOR CHANGES THAT COULD AFFECT GOALSCORING

Key Players:

- Their transfers and performances

Rule Changes:

- Video Assistant Referee(VAR) (2017)
- Five Substitutions Rule (2020)

Economic Factors:

- Foreign Ownership - Investments
- Financial Regulations (FFP) (2013)
- Revenue Growth

116%

Inflation in European football transfer fees

9%

Annual rise

CIES Football Observatory
Monthly Report

DID YOU KNOW?

Sheikh Mansour, the royal family of Abu Dhabi owns 81% of the City Football Group, of which Manchester City is a member. Also, City has been facing with 115 Premier League charges since 2023 for financial misreporting and obstructing investigations from 2009 to 2018. Penalties could include fines or even relegation if proven.

73%

Expansion in European football revenues

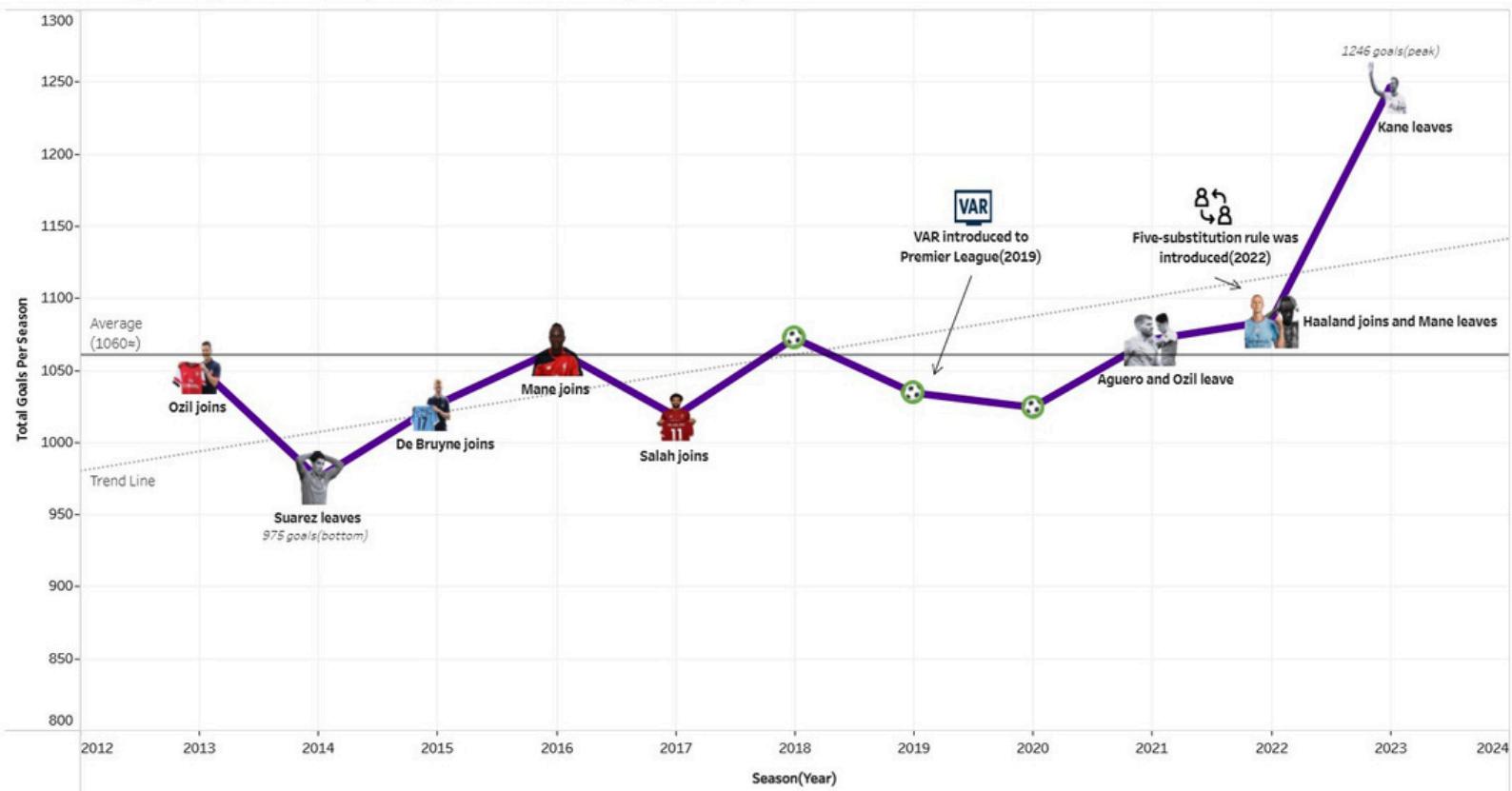
9%

Annual rise

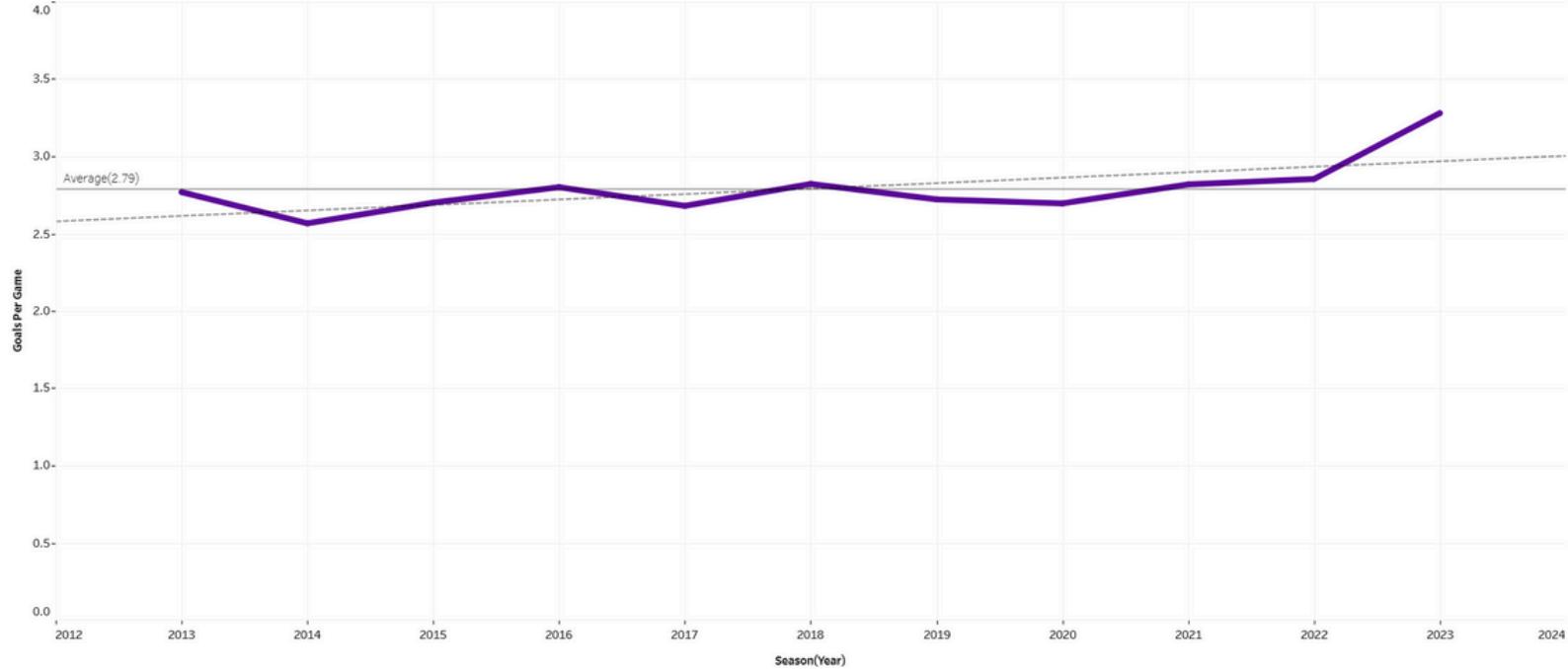
UEFA Club Finance and Investment Landscape Report

PREMIER LEAGUE GOAL TRENDS

Premier League: Key Transfers, Key Changes & Goal Trends(2013-2024)

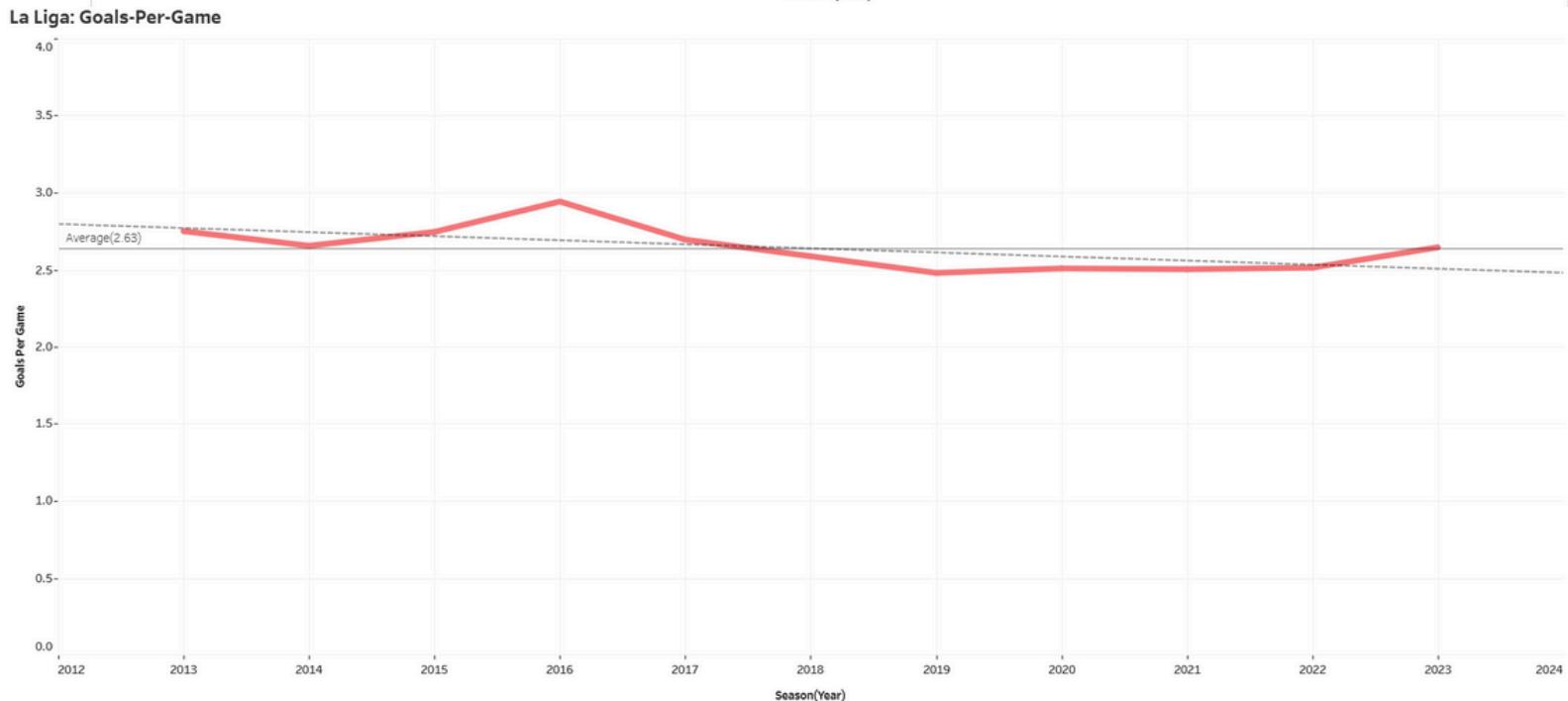
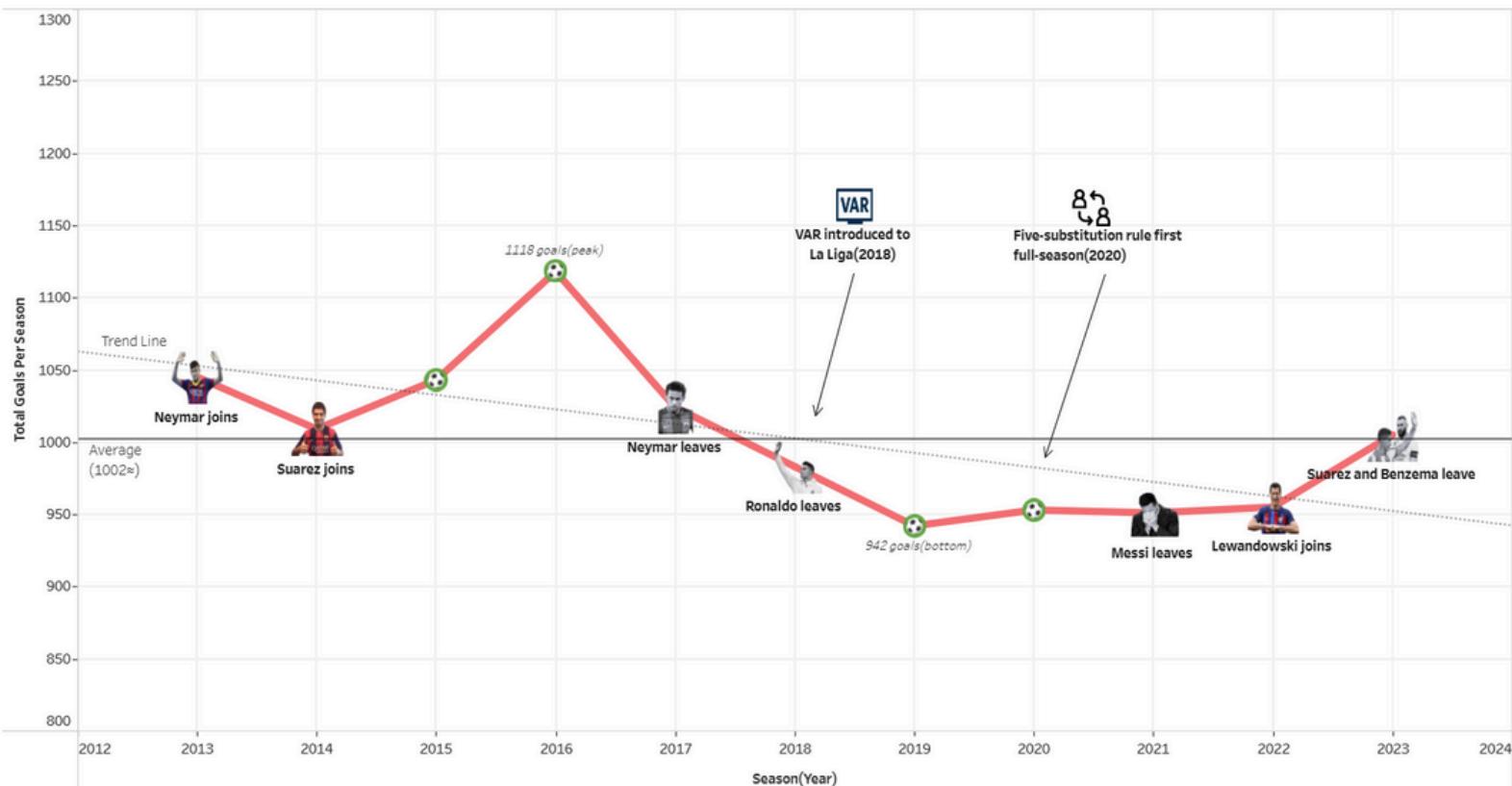


Premier League: Goals-Per-Game



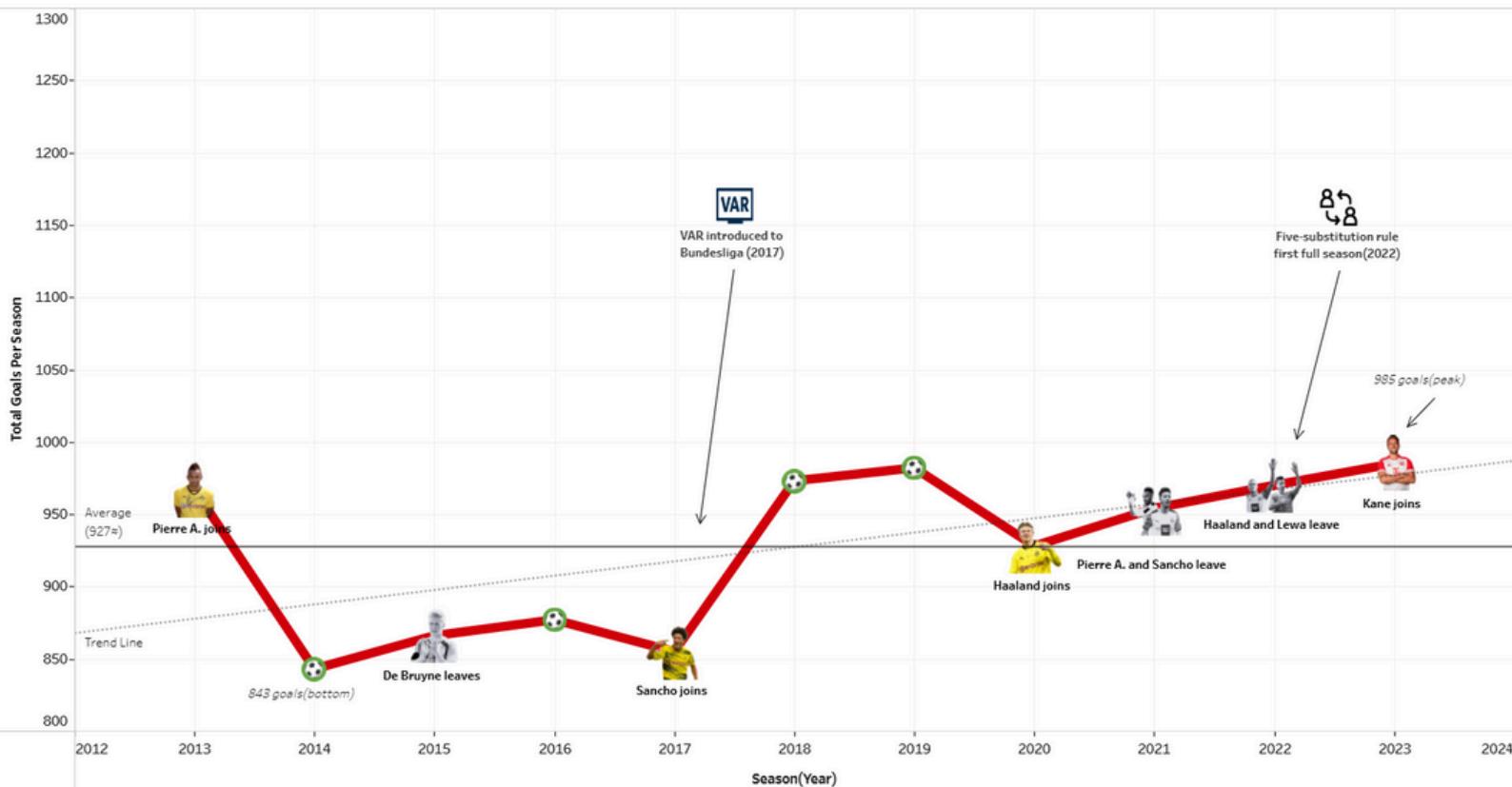
LA LIGA GOAL TRENDS

La Liga: Key Transfers, Key Changes & Goal Trends(2013-2024)

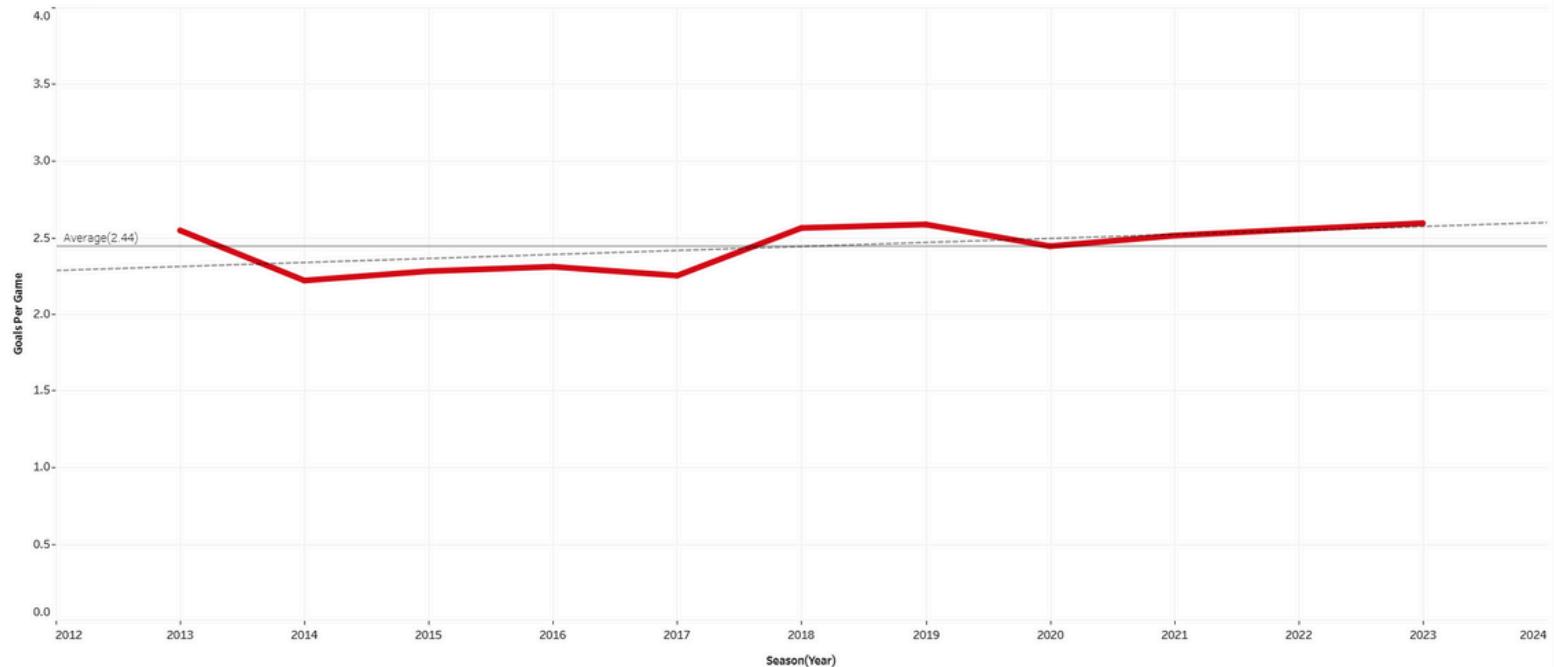


BUNDESLIGA GOAL TRENDS

Bundesliga: Key Transfers, Key Changes & Goal Trends(2013-2024)

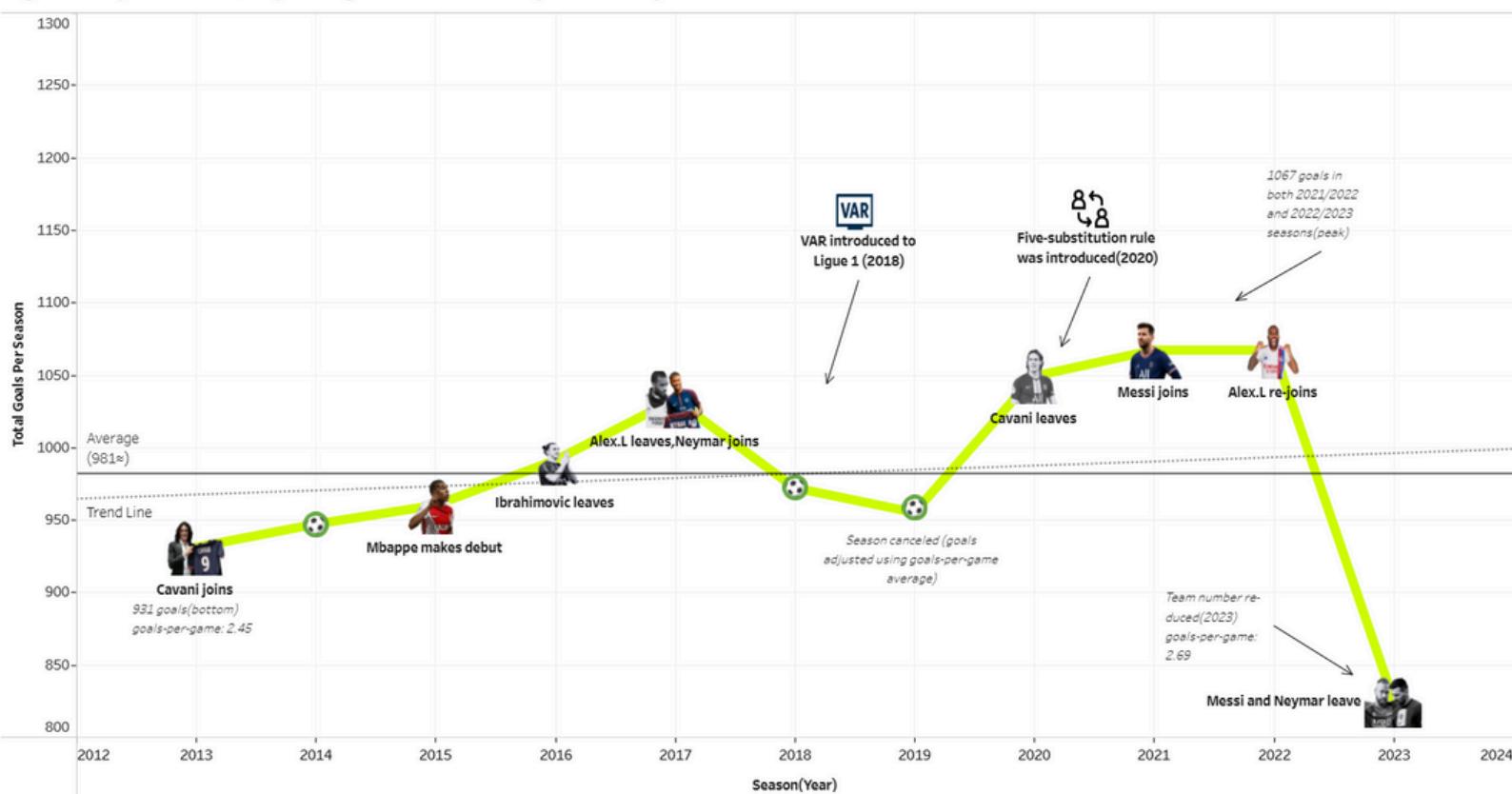


Bundesliga: Goals-Per-Game

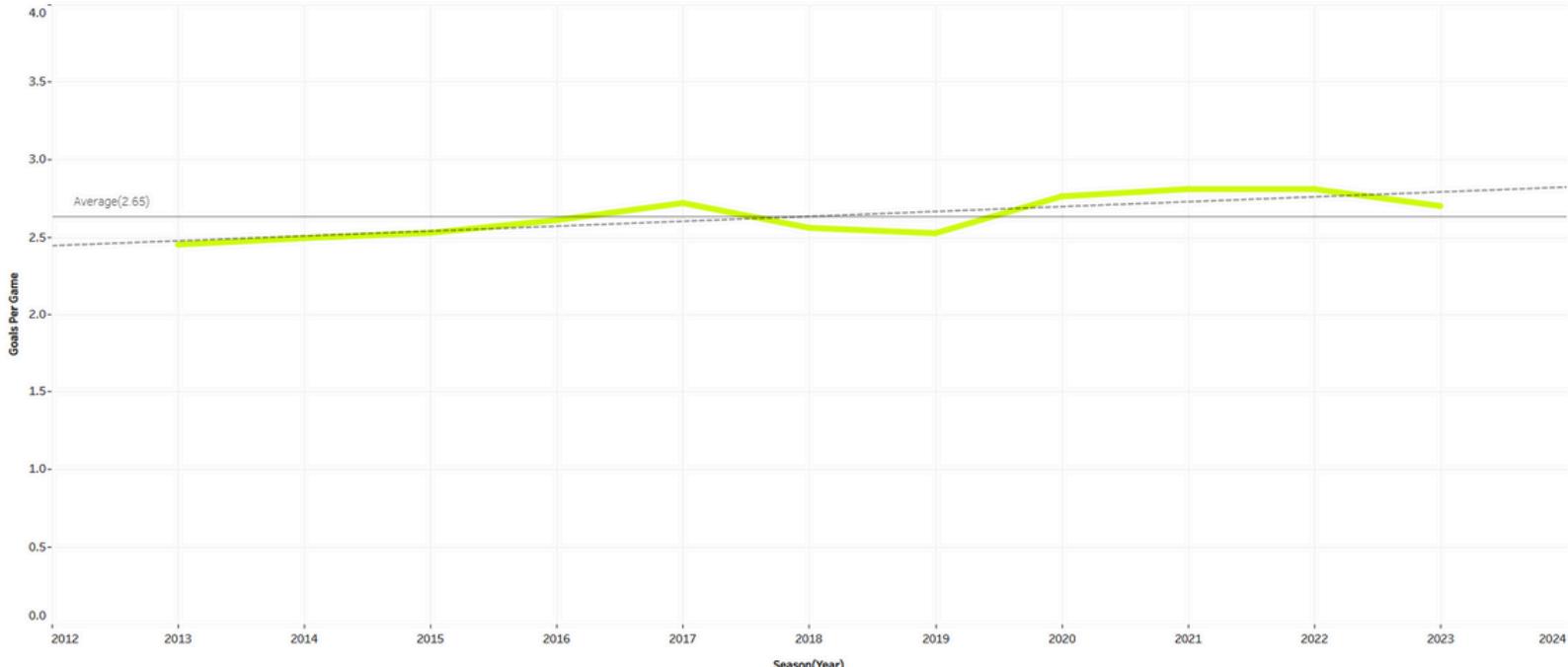


LIGUE 1 GOAL TRENDS

Ligue 1: Key Transfers, Key Changes & Goal Trends(2013-2024)

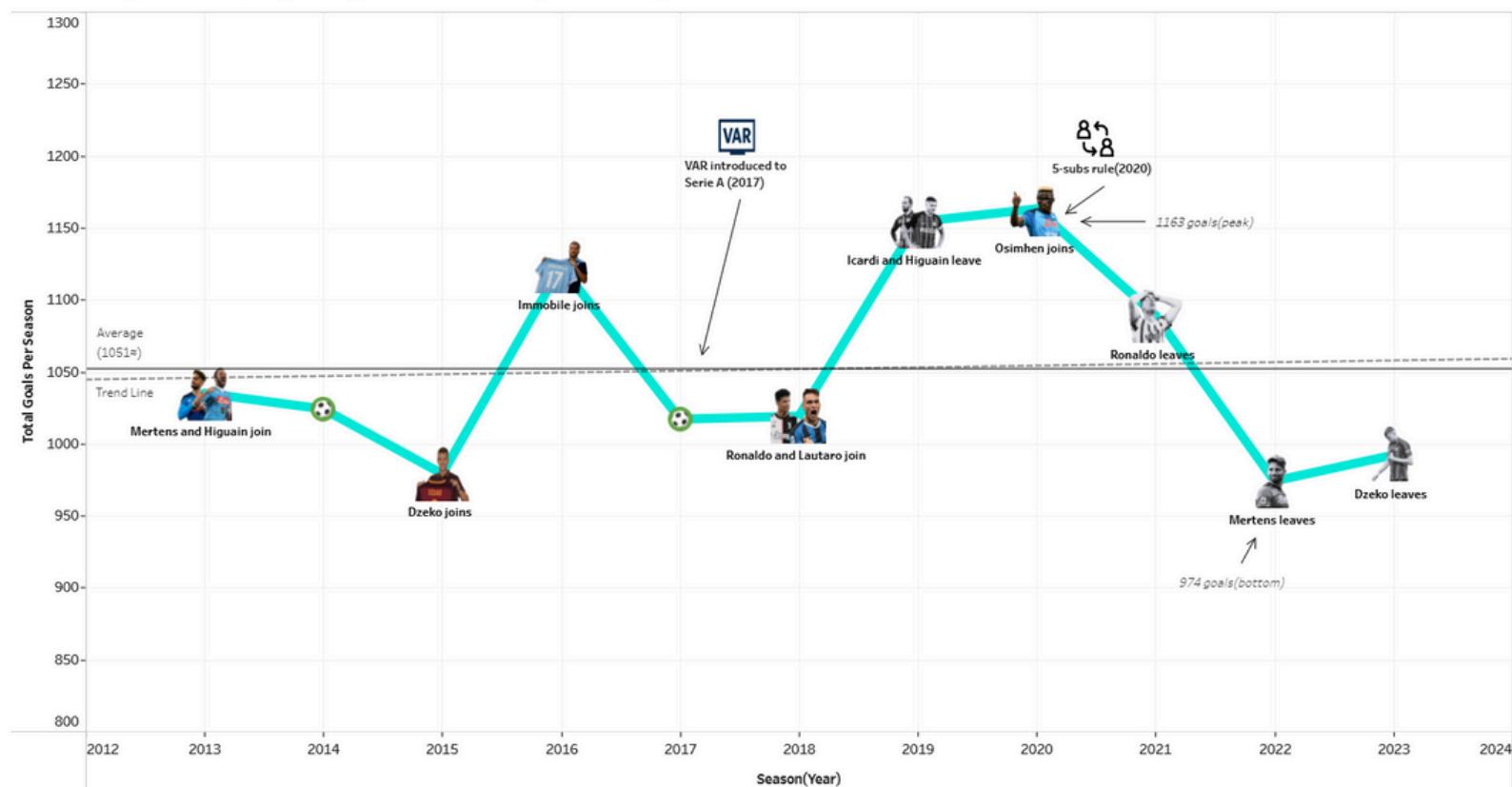


Ligue 1: Goals-Per-Game

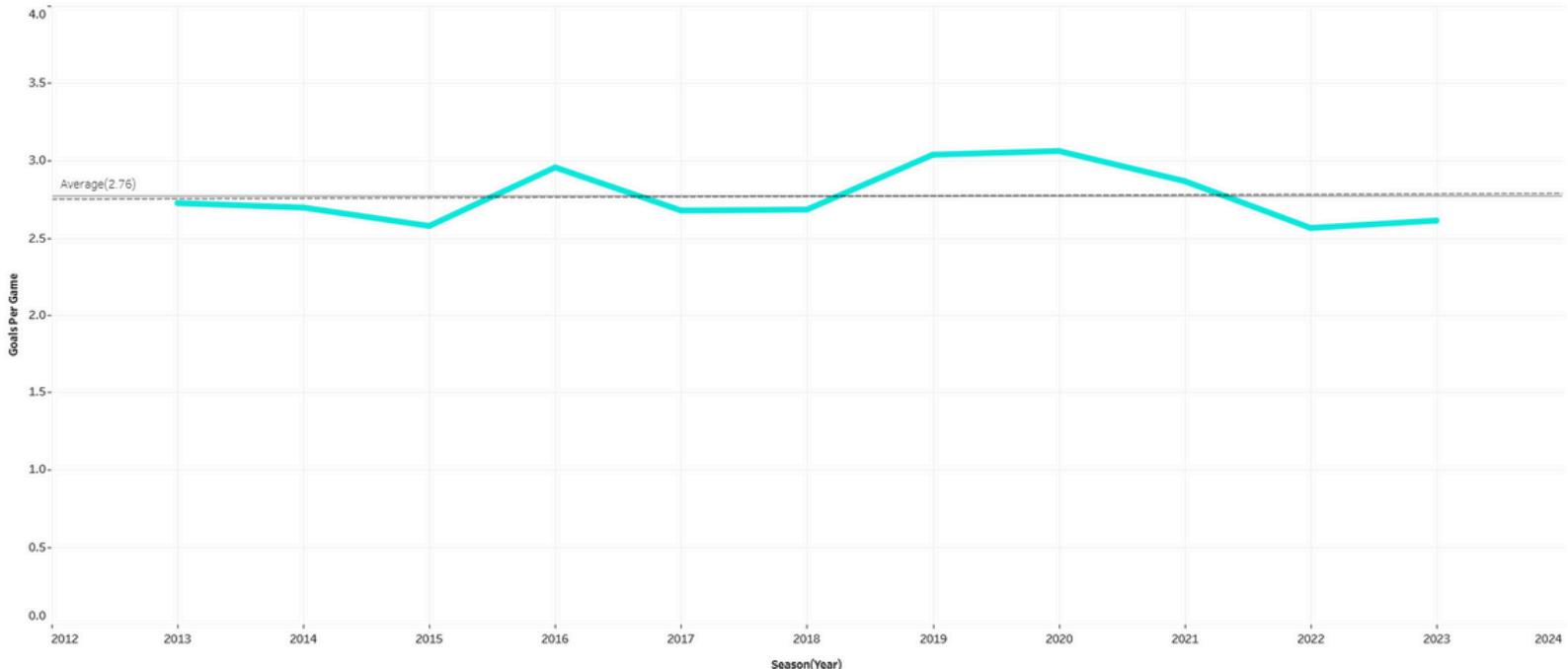


SERIE A GOAL TRENDS

Serie A: Key Transfers, Key Changes & Goal Trends(2013-2024)



Serie A: Goals-Per-Game





BIG 5 LEAGUES' GOAL TRENDS AND FACTORS ANALYSIS

VISION

To offer a comprehensive examination of Big 5's goal trends for the 2013–2023 timeframe, highlighting significant trends and changes.

MISSION

- **Part I:** Examine the effects of major player transfers and important rule changes (such as VAR and the introduction of five substitutes) on seasonal goal totals.
- **Part II:** Examine the impact of economic factors on seasonal goal trends, such as financial rules (FFP), foreign club ownership, and increased spendings in transfer fees and wages

PART I: KEY TRANSFERS



While we can't deny that record-breaker contributions by players sometimes resulted in fewer goals next season after the given player's departures, we see many inconsistencies with this belief, indicating that the rise of goal distribution(meaning "Goals spread across more teams and players rather than a few key(star) players").

In **Premier League**, despite Mohamed Salah's record-breaking individual performance (42 goals and assists) in the 2017–2018 season, league goals overall declined, and his contribution further dropped to 30 the following season, even as total league goals increased, indicating that tactical shifts and improved goal distribution played a greater role than individual impact. Similarly, Erling Haaland initially appeared to drive up goal totals, but in his second season (2023–2024), following Harry Kane's departure—who holds the record for the most Premier League goals for a single club—his contributions fell from 44 to 32, despite league goals peaking at 1246.

Moreover, this does not only apply to Premier League, but all the leagues we are reviewing. To give at least one example per league; In **La Liga**, 2014/2015 season when Suarez joined, Ronaldo and Messi peaked their contribution in this 2013-2023 period(65 and 64 G+A in order) and yet, the league's total goals decreased. In **Bundesliga** 2018/2019 season, we see a significant increase from the previous season, however, these season's most G+A contributor Lewandowski, had the numbers 31 and 32 respectively, but the change was 118 goals, could be only explained by increased goal distribution. In **Ligue 1** 2016/2017 season, Ibrahimovic leaves (the previous season's record breaking contributor, 51 G+A) while the most G+A contributor stood at 39, the total goals increased by 31. Lastly, In **Serie A** , the 3rd G+A contributor in 2014/2015 season was Higuain with 25, which he increased and were the leader in the following season with 38, as you can guess, the total goals decreased. All these cases suggest that overall goal increases are more likely the result of tactical evolution and increased goal distribution by other players rather than reliance on big stars.

But we must admit we have "**Exception that proves the rule**" cases, with most of it cluster in **Serie A** in 2016/2017, when total goals increased drastically, a lot of it depended on individual performances. When we look at top 10 G+A list, the difference was +72 goals from the previous season, explaining the half of the total increase that season(+144).

PART I: RULE CHANGES



When looking at rule changes, it initially appears that the introduction of **VAR** resulted in a significant drop in goals in the visuals every time VAR was introduced. It is a complex matter because it can be perhaps the players were more careful how they were playing, resulting in a conservative approach (more defensive, less total goals) or it can be that VAR was intervening more than it should when it was first introduced. The latter was the case for **Premier League** and since I have no consistent data for the other 4 leagues, just like how globally these top 5 leagues categorized together because of their similarity, we will have to assume there is a standard refereeing for the VAR.

There was **a net loss of 55 goals** during the first VAR season (2019–20) in Premier League, which resulted in a 5.13% drop in overall scoring. This influence, however, drastically decreased the next year (-19 goals, barely -1.84% impact). Surprisingly VAR had a positive contribution (+4 goals) in 2021–2022, but this was reversed in the **following seasons (-43 and -33 goals, respectively)**. Overall **-2.73% of VAR impact for Premier League**, -29 goals per season.

Therefore, we can see the negative almost like suppressing impact of VAR even with the exception (like in the player performances). When it comes to the psychological part, everyone seemed to be affected as De Bruyne told in 2020 "I don't know the rules anymore honestly". The players were more cautious, such in the analysis by onefootball.com of Serie A showed: "Coaches and players are currently more cautious about the fact that any of their moves may result in penalties or sending off, thereby making teams change their tactics."

Following COVID-19, **the 5-substitution rule** was made permanently throughout Europe in different seasons, bringing about minor but significant changes to the dynamics of matches. It was actually thought richer teams with deeper benches have a tactical edge, which causes the performance gap to widen, but according to this research, and the impact varies across leagues and teams, with no clear evidence that it strengthens rich clubs. The rule has undoubtedly improved tactical flexibility, enabling managers to respond quickly with new attackers or reinforce defensively, even though there isn't enough statistical evidence to directly connect it to more goals. However, we know that 13.3% of goals scored in the Premier League in 2023-24 came via subs, making a record, which shows an increase from 8% which was the last season before 5 subs.

PART II: OWNERSHIP



The financial capacity, strategic vision, and general competitiveness of a football team can all be significantly impacted by something called **foreign ownership**. It frequently brings in large amounts of money, which could help teams advance by paying for player acquisitions, infrastructure upgrades, and even international marketing campaigns as well as raising questions about financial fair play laws, excessive financial gaps between teams, and clubs losing their sense of identity. Examining foreign ownership patterns now, together with other financial parameters we will be looking thoroughly in the next slide, can offer important insights into how global capital affects the top football leagues in Europe in terms of goal trends.

I would like to start with **Premier League** which were 8/20 teams in 2013 and reached to 17/20 in 2023, an interesting finding being 9/20 being USA-owned.

In contrast, **La Liga** remained predominantly domestically owned, with only 6 clubs under foreign control by 2024. Notable takeovers include Valencia (Singapore), Espanyol and Granada (China), Almería (Saudi Arabia), and controversially, Girona, largely owned by the UAE's City Football Group, raising questions around financial fair-play.

The **Bundesliga**, protected by the 50+1 rule, experienced minimal foreign influence, with RB Leipzig (Austria's Red Bull) remaining the sole foreign-controlled club.

Meanwhile, **Ligue 1** experienced rapid internationalization, jumping from just 3 foreign-owned clubs in 2013 to nearly half the league (9 clubs) by 2024, led by major investors such as PSG (Qatar), Monaco (Russia), and several U.S.-owned clubs including Marseille, Lyon, Toulouse, and Strasbourg.

Similarly, **Serie A** transformed significantly: from only Roma having foreign ownership in 2013 to 9 clubs by 2024 predominantly under North American control including iconic teams like AC Milan, Inter, and Atalanta. Another interesting finding is that Chinese investors initially entered but were mostly replaced by American owners in the 2020s.

Overall, foreign ownership reshaped the Premier League, Ligue 1, and Serie A, made moderate inroads in La Liga, and had minimal impact on the Bundesliga.

PART II: ECONOMICS



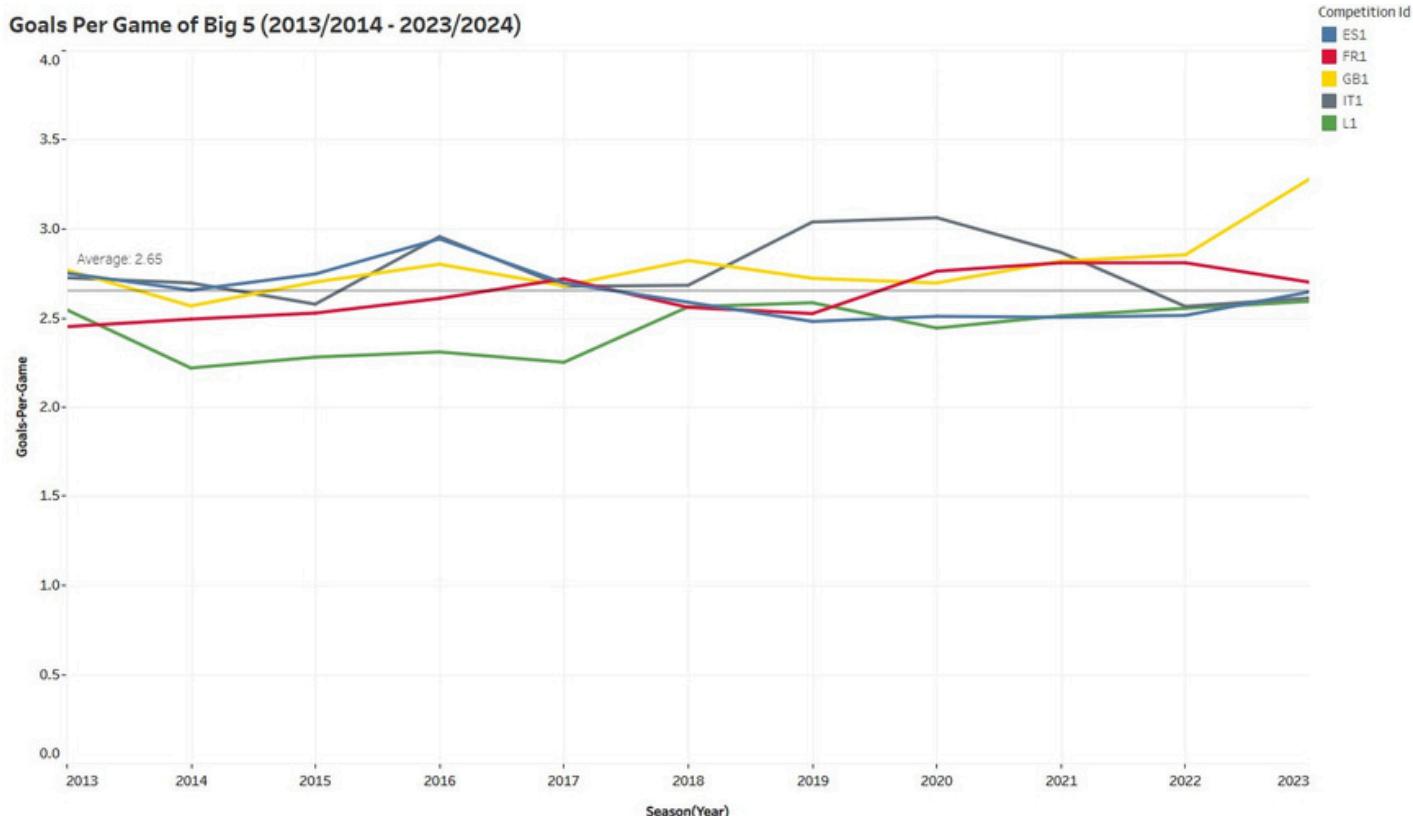
We see that total goals are increasing ever so slightly, but revenues and spendings increased drastically more, yet we are not seeing the reflection on the stats, even though the spendings are more than doubled. This indicates more that football, as an industry, grew more than the statistics could have. Instead, what we are seeing is a moderate growth trend in the Goals-Per-Game with 4.45%, the growth numbers and spendings are much more higher than 4.45%.

Lets take a look at transfer fees committed by league, with add-ons (2015-2024):

Premier League clubs spent €23 billion (2015–2024), with roughly €9.67 billion of €16.99 billion (57%) spent by the "Big 6." Yet, Chelsea's €630.25m spending in 2022/2023 lead to a 12th-place finish, shows high spending doesn't always mean success. **La Liga** spent approximately €8 billion, peaking in 2019 (€1.37 billion), mostly concentrated on Barcelona, Real Madrid, and Atlético Madrid, who dominated domestically but had costly failures, such as Barcelona's €300m misspending on Coutinho and Griezmann. **Bundesliga** clubs invested €7.2 billion, maintaining balanced finances with a moderate deficit (-€0.59 billion). Bayern Munich's significant spending (€1.20 billion) translated into consistent titles, contrasting Hertha Berlin's relegation after a €374m investment. **Ligue 1** spent about €7.4 billion yet notably achieved net transfer profits (+€0.23 billion), highlighting a model focused on talent development. PSG dominated financially (€1.90 billion spent), winning eight domestic titles but failing to secure European success, while clubs like Monaco and Lille succeeded with modest budgets. **Serie A** clubs had substantial expenditures (€10.8 billion, -€1.46 billion net), primarily driven by Juventus (€1.77 billion), AC Milan, Inter, and Napoli. High spending generally helped with domestic success, but it didn't result in European competitions.

In terms of revenue (2013–2023), significant increases accompanied this rise in spendings: **Premier League** revenues rose by 79%, **La Liga** saw the highest growth at 83%, **Bundesliga** and **Serie A** each increased by 68%, and **Ligue 1** experienced the lowest yet notable growth at 58% while being the only league with net transfer profit!

DATA ANALYSIS & CONCLUSIONS

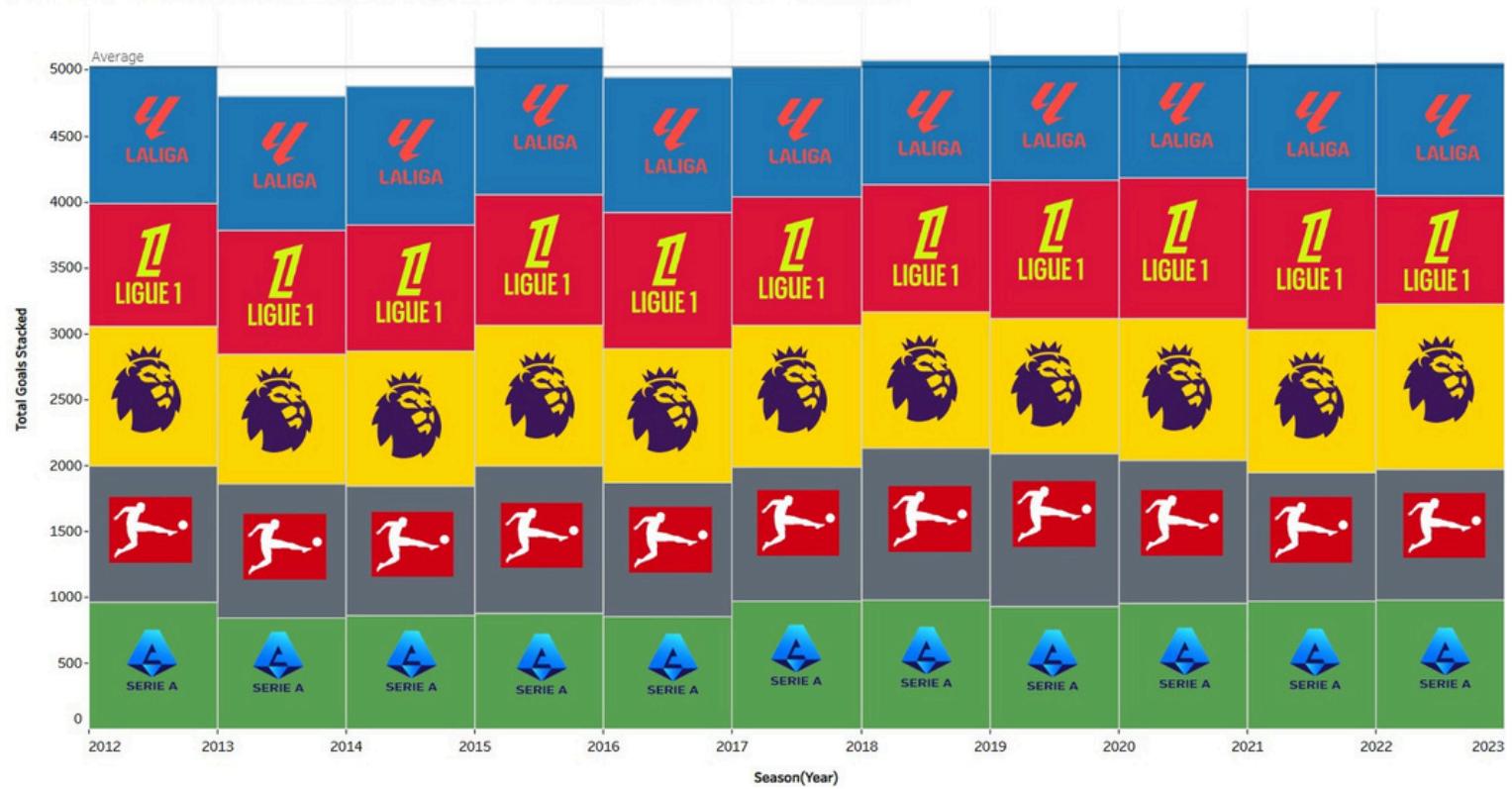


One thing we know is **except for La Liga, all the leagues have a positive trend**. Now, examining Goals-Per-Game data based on the factors will be helping us understand the interactions better together with numbers, and the main question is what affects the goals the most?

- **Premier League(GB1)** consistently showed a higher than average (2.65) goal rate except for a slight dip in 2014/15 (2.56), together with a record-breaking 3.27 goals/game in 2023/24. And this period coincided with massive investments (€23 billion transfer spending (265% rise from 2013!, 79% revenue growth and foreign-ownership increase) and therefore we can think economics played a role in this rise, but we should not forget that the tactics(more attacking) and increased goal distribution are even more important, my data analysis project concludes. As we will be diving into the other leagues, my analysis will be proved further.
- **La Liga(ES1)** peaked significantly in 2016/17(2.94), alongside of the prime years of Messi and Ronaldo, and was higher than the average goal rate but followed notable decline from 2017/18 onwards only to return to the average line in 2023/2024 season, despite the most revenue growth (+83% revenue) and more than 8 billion spending(the 3rd most). This shift marks my argument about tactics and goal distribution rather than economical numbers.
- **Serie A(IT1)** jointly highest with La Liga until 2017/18, peaking in 2020/2021 with 3.06, experienced the biggest fluctuations, having the most stable trend line overall, and was the only league to be affected the most with key players(2016/2017) Its slight decline and subsequent stabilization reflect tactical adaptations after high-profile player movements, despite substantial financial spending, €10.8 billion(the 2nd most).
- **Bundesliga(L1)**, uniquely the only one to be below the 2.65 threshold all the time, experienced a sustained rise post-2018/19, only to peak at 2.59 in 2023/2024. The careful financial model (€7.2 billion spent, the least spent in big 5, and moderate deficit) and limited foreign influence (RB Leipzig exception) correlate again with gradual but consistent tactical developments leading to higher scoring.
- **Ligue 1(FR1)** demonstrated significant change: rising steadily until 2017/18 for 5 seasons consecutively, then dropping until 2020/21, before rebounding and dropping slightly again in 2023/2024(the only league to not rise in that season). Had 2 peak seasons with 2.80 (20/21 and 21/22).Despite financial dominance by PSG (€1.9 billion spent), it's notable for being the second least spender and having the only positive net transfer balance , emphasize tactics before economy, yet once again.

FINALIZATION!

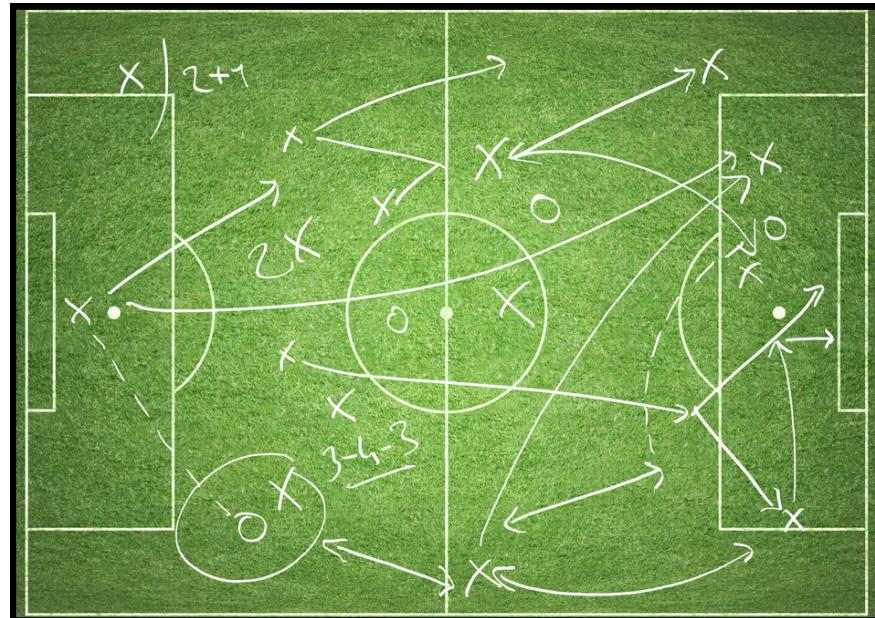
Total Goals Scored Stacked in Top 5 European Football Leagues (2013/14 to 2023/24)



Despite an overall modest increase of 4.45% in Goals-Per-Game across all five leagues, transfer expenditures and revenues surged disproportionately. Hence, while financial expansion significantly reshaped European football's landscape undoubtedly, total goals increased only slightly, this underscores that tactical innovation and goal distribution among players, it shows that teams are adapting to be more collective scorers, and these were more influential than mere financial investments.

Looking at the stacked visualization of total goals from 2013/14 to 2023/24, can help us see the big picture also. We see remarkable stability and moderate increase in the recent years. Despite considerable financial injections, particularly evident in leagues such as the Premier League and Serie A, the overall height of the stacks has not changed significantly, reinforcing that goal totals have not grown proportionally to economic growth. And the visualization emphasizes the relatively stable share of each league, notably with the Premier League maintaining a consistently large proportion and even expanding. But conversely, La Liga's portion visibly shrinks post-2017/18, coinciding with key player departures and tactical shifts, illustrating the crucial role of strategic adaptations beyond finances alone. Thus, the visual confirms that while money can profoundly reshape the dynamics of football, actual goal output remains more intricately tied to tactics, player distribution.

FUTURE RESEARCH & CONSIDERATIONS:



While this analysis has demonstrated that tactical evolution and player distribution significantly outweigh just financial factors in influencing goal trends, deeper analysis and future research shall emerge:

1. Tactical Evolution and Analytics:

- Future projects can dive deeper into tactical analytics (expected goals (xG), formations, pressing strategies, defensive structures etc.) to better quantify exactly how tactics influence scoring patterns beyond financial factors. As well as, the comparison between rich and poor teams in the given league.

2. Expanded VAR and Rule Change Analysis:

- A detailed comparative study of VAR impacts across different leagues, analyzing specifics such as penalty frequency, offside calls, and disallowed goal statistics. Also, further exploration into how the tactical flexibility provided by the 5-substitution rule evolves, particularly how wealthier clubs leverage deeper benches compared to less financially powerful teams, although there is one research, it is not enough to conclude yet.

Final Thoughts:

Football, as revealed by this analysis, is not purely a financial thing, but a complex interplay between economics, tactics, regulations, and human dynamics on the pitch. Future studies could leverage more data and advanced analytical models to deepen our understanding of these relationships.

Ultimately, while money significantly can shape the competitive landscape, the heart of the game(goals) ,and thus its scoring dynamics, remains still driven by human decision making, strategic innovation, and adaptability to change.