

Assignment 2 - Liverpool weakness analysis and player recommendation



Mathematical Modelling of Football - 1RT001
2025-10-19

Gustav Andersson, Marcus Arpe, Hjalmar Dahlberg, Firat Gümüs,
Jakub Hasiec, Cedric Kaneza, William Lundström, Xinyu Meng,
Tebogo Sanelo Mitane, Efstathios Papadopoulos, Rafael Proenca

Liverpool Recommendations

As a team, we conducted an in-depth analysis of Liverpool's squad structure and performance during the 2017/2018 season to provide data-driven support for the recommendation to strengthen the squad for the 2018/2019 season through the signing of a new midfielder. The findings of this analysis are outlined below.

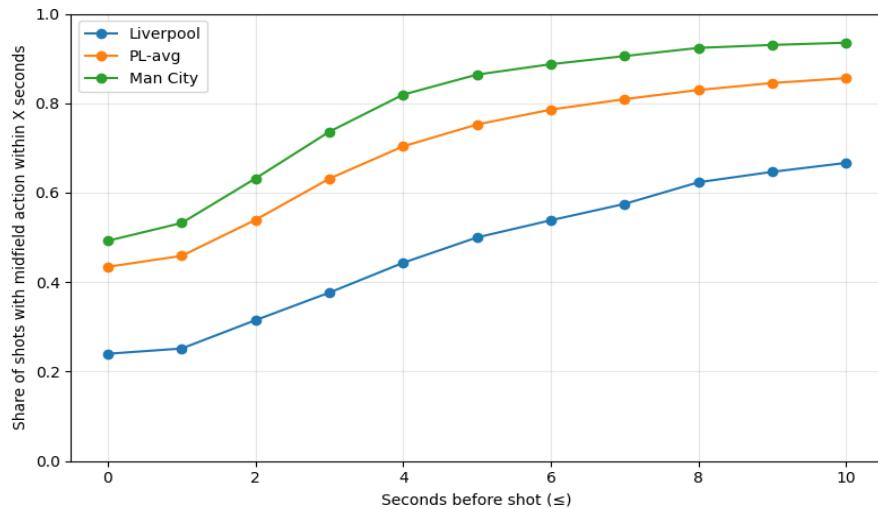


Figure 1. Cumulative share of events leading up to a shot, including the shot itself.

Figure 1 illustrates the cumulative share of events leading up to a shot, including the shot itself. The starting point of each line represents the percentage of shots taken by midfielders. Liverpool's line starts significantly lower than both Manchester City and the league average, indicating that their midfielders accounted for a much smaller proportion of shots. As the timeline moves further back, Liverpool's curve remains below the others, showing that their midfielders were also less involved in the buildup to shots. Collectively, this highlights that Liverpool's midfielders contributed substantially less to shot creation compared to most other teams.

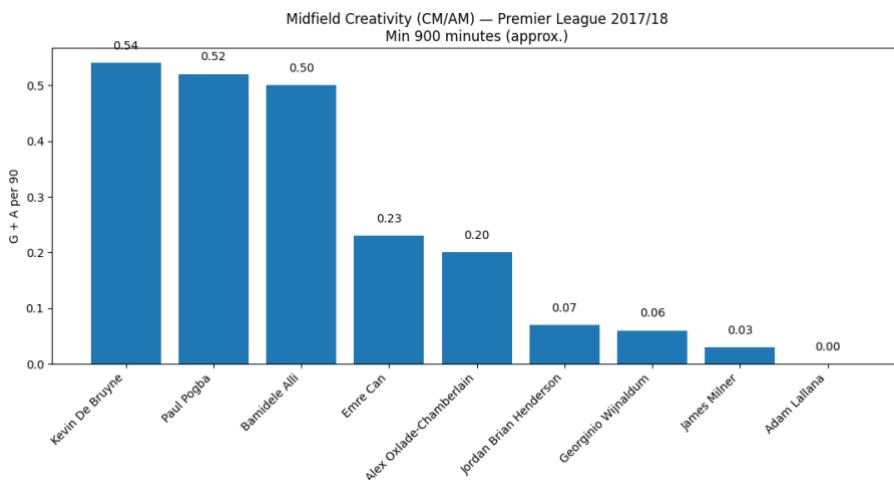


Figure 2. Midfield creativity analysis

Another analysis was conducted to evaluate the team's needs in terms of creativity and goal contribution from midfield, as shown in the figure below. This analysis combines goals and assists per 90 minutes from key central midfielders at top Premier League clubs to highlight potential deficiencies in Liverpool's creative output. The findings reveal that midfield creators at other leading clubs consistently outperformed Liverpool's midfielders in combined goals and assists, underscoring a significant creativity gap in Liverpool's midfield during the 2017/2018 season.

Team	Total number of midfielders	Midfielders (> 1000 min)	Midfielders (>500 min)
Manchester City	11	7	8
Manchester United	9	5	8
Chelsea	9	5	6
Tottenham	8	5	8
Liverpool	7	5	5

Table 1. Number of midfielders and minutes played

In our analysis, we also considered the depth of the squad among top Premier League teams, focusing on the number of players and their minutes played. Based on the data, Liverpool had the smallest midfield group, with only 7 total midfielders - a notably low number. While 5 of them have played over 1000 minutes - similar to other top clubs - the lack of depth is clear: Liverpool had no additional midfielders in the 500–1000 minutes played range, indicating an over-reliance on a core group. In contrast, clubs like Manchester City, Manchester United and Tottenham had 8 midfielders who played over 500 minutes, reflecting more balanced rotation and greater depth. This limited pool for Liverpool increases the risk of fatigue or injury affecting team performance, especially in a long season with multiple competitions (Premier League, Champions League, FA Cup). To maintain competitiveness and ensure consistent performance, Liverpool would benefit from strengthening their midfield with at least one reliable player.

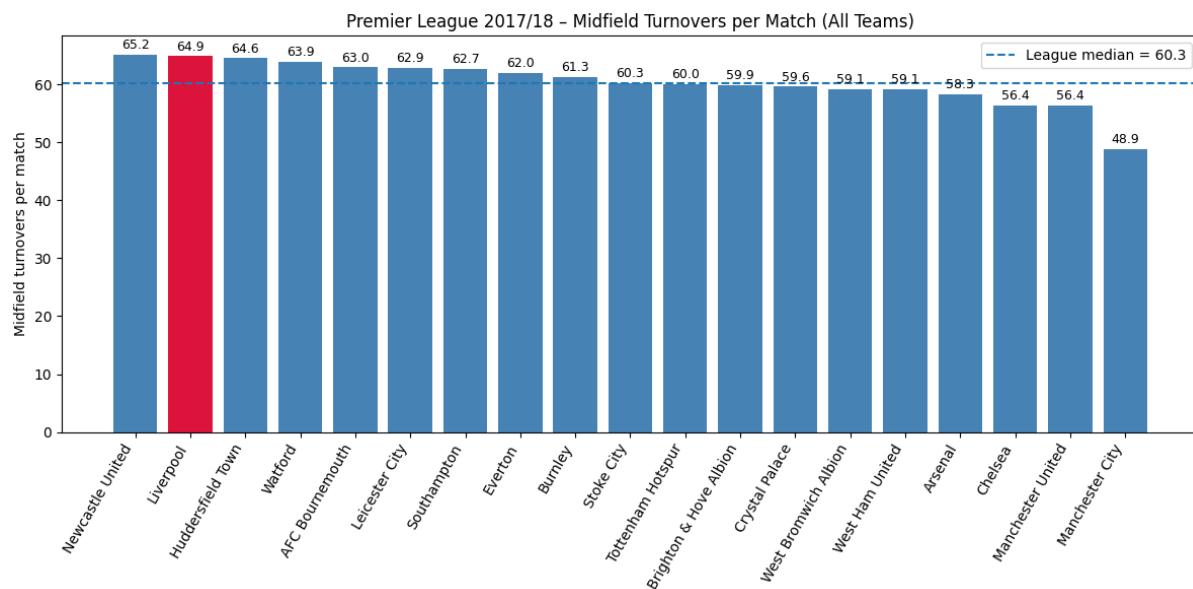


Figure 3. Midfield turnovers per match

Finally, we also created and analyzed the chart covering all Premier League teams, which reveals that Liverpool ranks second in turnovers - defined as ball losses in the middle third resulting from failed passes, duels, or dribbles. Liverpool averaged approximately 64.9 turnovers per match, second only to Newcastle (65.2) and noticeably above the league median (60.3). At the opposite end of the spectrum, Manchester City (48.9) leads in ball security, followed by Manchester United (56.4), Chelsea (56.4), and Arsenal (58.3), all of whom are notably more secure in central buildup play. Among the “big six,” Liverpool stands out as one of the more turnover-prone sides, reflecting their high-tempo, vertical style of play.

Given all the reasoning above we claim that Liverpool should focus on strengthening in the midfield area with at least one more midfielder.

Suggested Recommendations

Gaston Ramírez would make a strong addition to Liverpool's midfield as he is better at playing the ball forward than Özil and willing to make defensive sacrifices according to my metrics. This covers Liverpool's greatest weaknesses in the midfield, both offensively and defensively. His market value is €10M which is relatively low and in his prime at age 27.

Nabil Fekir would be a great fit in Liverpool's midfield, he provides creativity and was a top player in my metric which is regarding linking winning possession to goal-scoring opportunities. This proves that he has both defensive and offensive qualities which would supplement the midfield well. This is also a realistic transfer due to his age being 24 which makes this a good investment for the future and also due to his reasonably low market value.

Frank Anguissa shows quality in the counterattack and willingness to counterpress by having one of the highest xT/90 after regaining possession of the ball in the top five leagues making him a great fit for Liverpool's midfield. His market value at €25 million and only being 22 years old make him also an affordable investment.

Ousmane Dembélé is the rational target for Liverpool's 2018 need: a right-side wide creator who turns flank possession into quick shots. He ranks among La Liga's leaders at high volume. Compared with higher scorers like Messi or Suárez, Dembélé matches the required role, offers a better age curve and total cost of ownership, and preserves squad balance.

Suat Serdar stands out as a very good signing for Liverpool, ranking first in the Counter-Pressing Effect Value (CPEV) metric across Europe's top five leagues—a measure of how effectively players turn counter-pressing moments into goal-scoring opportunities. His ability to regain possession in advanced areas and immediately create attacking danger highlights his fit for Liverpool's high-intensity style. At just 21 years old and already proven in the Bundesliga, he combines tactical maturity with long-term potential, making him a financially smart target at around £10 million.

Manu García is a good midfielder to sign in terms of defensive actions. He has the highest amount of xTP (expected threat prevented), a metric that measures how effectively a player reduces the opponent's expected threat, through defensive actions such as interceptions, duels and blocks etc. García also had a success rate of over 51 %. By signing Manu García the defensive part of the team could be greatly improved.

Luis Alberto (Lazio, 2017/18). Alberto is a creative midfielder who plays between the lines and unlocks defences with disguised through balls and quick one-twos. He would give Liverpool a central source of chances, not just from wide areas, by feeding Salah and Mané and combining with Firmino. He fits as an advanced "8" in 4-3-3 or a "10" in 4-2-3-1, and adds set piece quality. The main risk is adapting to the Premier League's pressing and physical tempo, so he'll need a clear pressing role and support from the holding midfielder.

I recommend signing Toni Kroos. In my xP (expected pass completion) model, trained on the Premier League and applied across the top five leagues, he ranks #1 for beating xP at real volume (≥ 350 attempts). His passing skill is high, he progresses safely, and limits turnovers. If we want reliable possession and chance creation flow, Kroos is the best bet.

I recommend Jorginho (Jorge Luiz Frello Filho) , he is clearest midfield signing for Liverpool because he tops the Stabilized Expected Threat (sxT) leaderboard across all five major leagues at 0.218 sxT/90, meaning he adds the most reliable attacking value per minute progressing the ball into dangerous zones while minimizing risk. That profile maps directly onto our needs: we're slightly above league median for mid-third turnovers, and Jorginho's game short to medium line breaking passes, constant scanning, and press resistance raises possession security while still advancing play. Unlike flashy, lower percentage progressors, his high sxT shows he repeatedly completes the actions that matter (xT gain \times high success probability), which stabilizes our build up and feeds early entries to Salah/Mané while keeping our counterpress set. Tactically, he's a natural single pivot for a 1-4-3-3: dictates tempo, connects centre backs to the half-spaces, and breaks pressure with angles

rather than dribbles (exactly the kind of stability our data flags as missing in central lanes). Add in his peak age profile (summer 2018), elite availability and minutes, and proven performance in a high tempo system, and he's the most valuable secure upgrade addressing ball retention and progression without sacrificing our transition threat.

I am recommending Mikel Merino to be selected because of his highest score of all the midfielders in the Premier League for the created Progression Transition Metric (PTM) indicating his offensive style of playing and high efficiency in quickly moving the ball forward after regaining the ball. His style of playing would strongly fit Jurgen Klopp's vision of attacking football. Additionally, Merino was a very young (at that time) and prospective player with a relatively low market value (10,00 mln € in TransferMarkt). Ps. as of 2025 we also know that he indeed strongly developed as a player and has been recently signed by Arsenal for 50,00 mln € ensuring his high potential and value.

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Final Recommendations

After evaluating the eleven shortlisted players and considering all relevant pros, cons, and performance metrics, we selected Mikel Merino and Jorginho as our top recommendations.

Mikel Merino emerged as the leading candidate among Premier League players in the Progression Transition Metric, which highlights his efficiency in quick and accurate ball progression following ball recovery. He also ranked among the top performers in the Counter-Press Effect Value, indicating his effectiveness in turning counter-pressing moments into immediate attacking opportunities. Considering his young age, relatively low market value, and a style of play well-suited to Jürgen Klopp's attacking philosophy, we consider him as a strong candidate for signing.

Our second recommendation is Jorginho, who recorded the highest score across the top five European leagues in the Stabilized Expected Threat (sxE) metric. This reflects his ability to consistently and accurately move the ball forward while generating an attacking threat. Despite his high market value (estimated at €60 million), we believe Jorginho represents a valuable opportunity to significantly strengthen Liverpool's midfield in terms of ball progression and control.



Figure 4. Mikel Merino



Figure 5. Jorginho