



Do Teams Pay for What Actually Predicts Performance?

Evan Deutsch and Jack Neckritz

Introduction

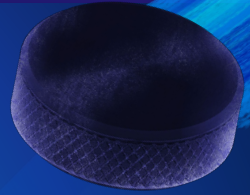
NHL player salaries have risen dramatically over the past decade, while player performance has remained relatively stable.

This raises a central question:

Are NHL teams allocating cap space efficiently, or are they overpaying for metrics that don't predict future value?



Research Questions



1

How does spending and cap distribution relate to team success?

2

What player metrics correlate most strongly with contract AAV?

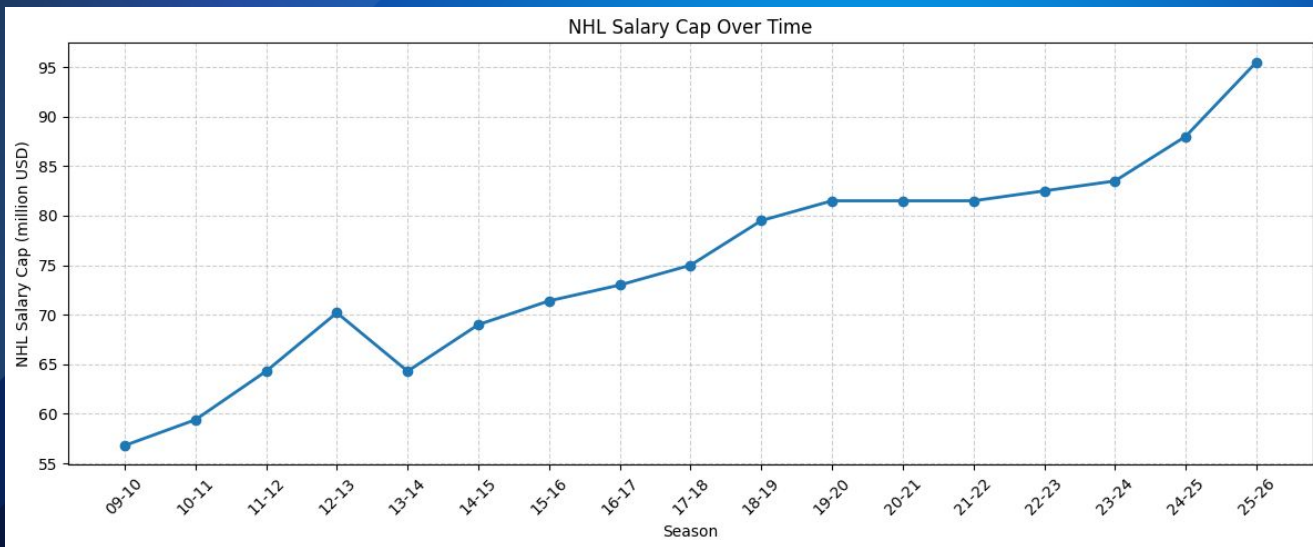
3

Which metrics best predict post-signing performance?

4

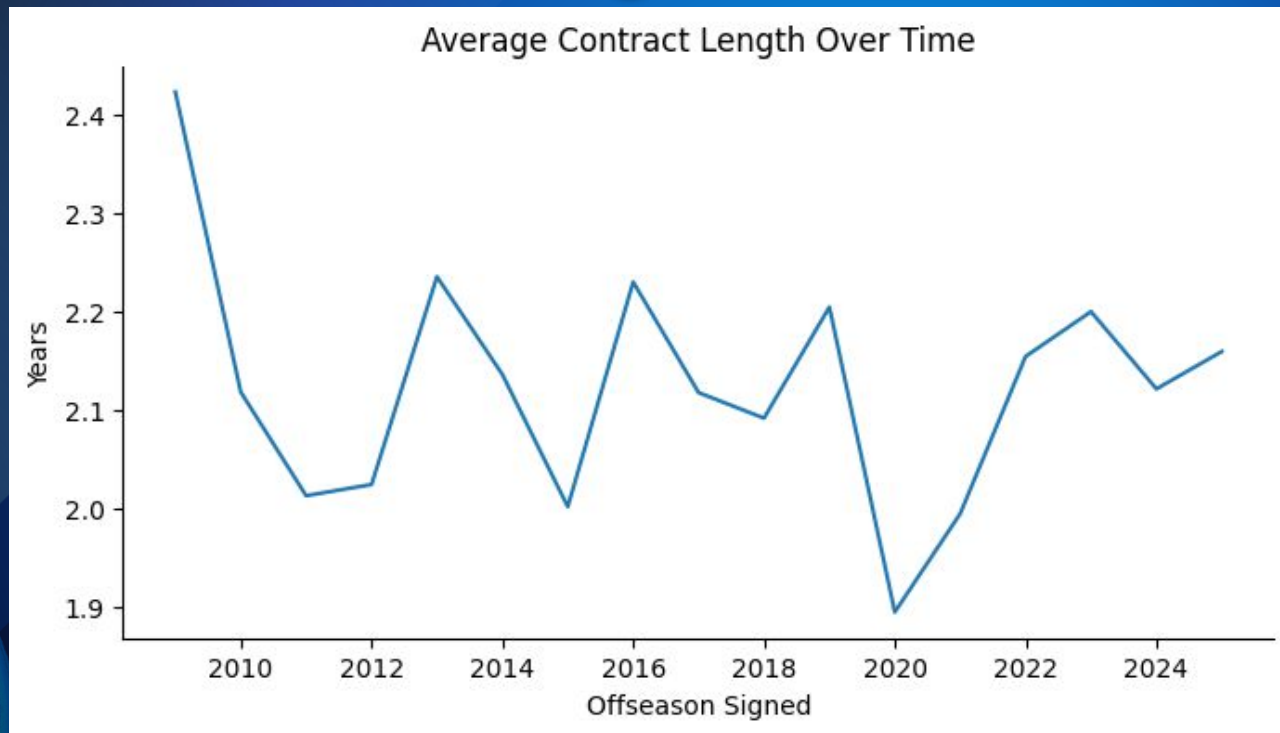
Is there a mismatch between what GMs pay for and what actually drives future value?

NHL Salary Cap



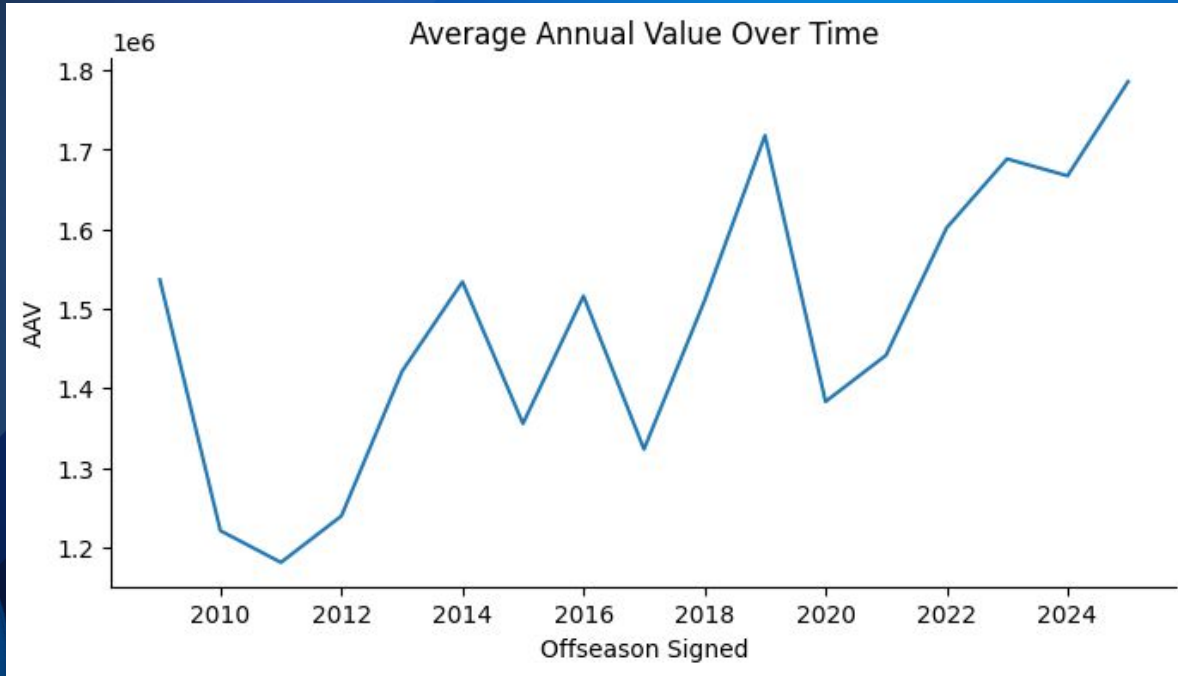
NHL Salary Cap has steadily increased over the past decade. The recent spikes are to make up for the lost cap increases as a result of the COVID-19 pandemic

Average Contract Length



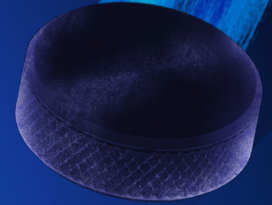
Contract length declines after the 2012-13 CBA introduced max-term limits. After the adjustment, contract length remains flat, indicating stable GM behavior

Average AAV Over Time



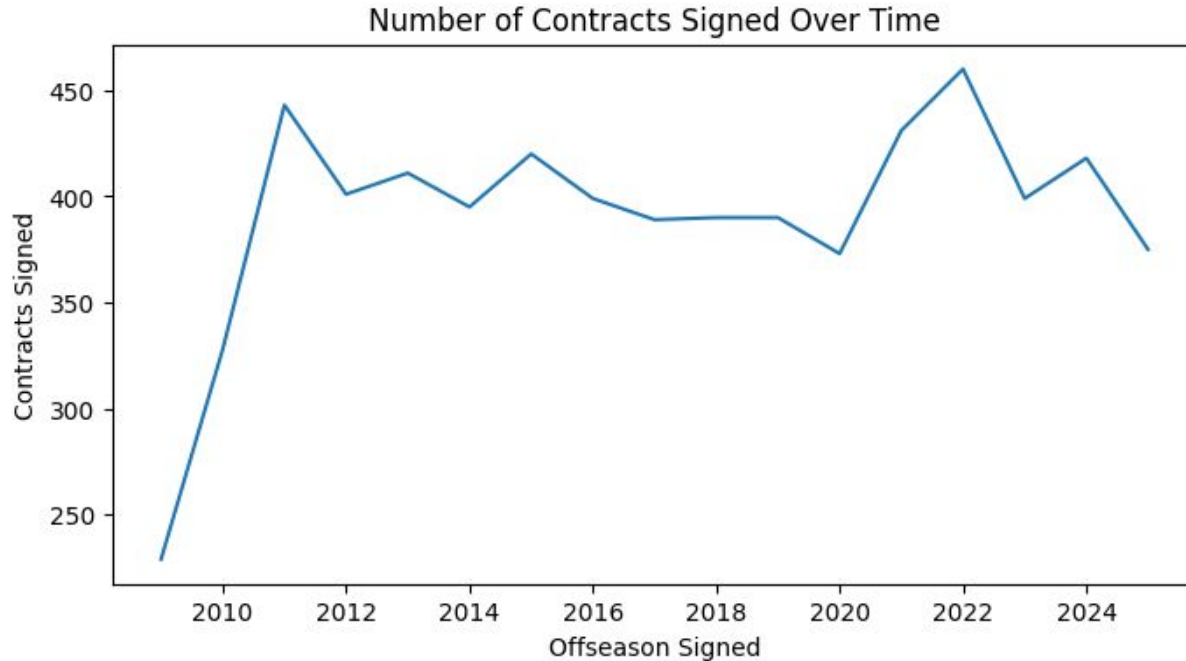
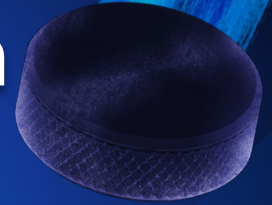
Average AAV rises **consistently and sharply** across the last decade. This increase is unrelated to improvements in player performance. Teams are paying more per player than ever before primarily due to rising cap space and revenue changes

Total Total Contract Value



Total contract value fluctuates, but AAV continues trending upward. This shows that teams are paying higher prices without extending contract terms.

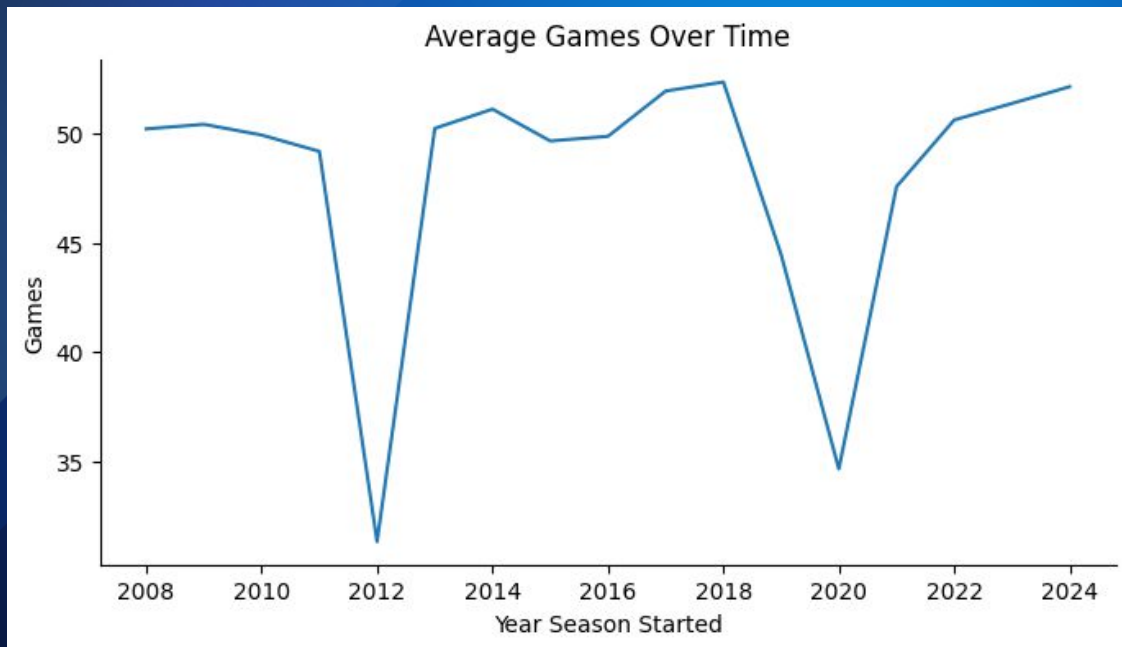
Contracts Signed Per Season



The number of contracts signed each offseason stays relatively stable.

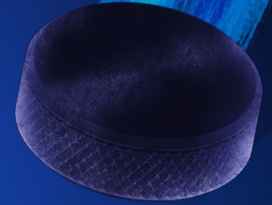
The rise in spending is driven by **higher pricing**, not increased volume.

Average Games Played



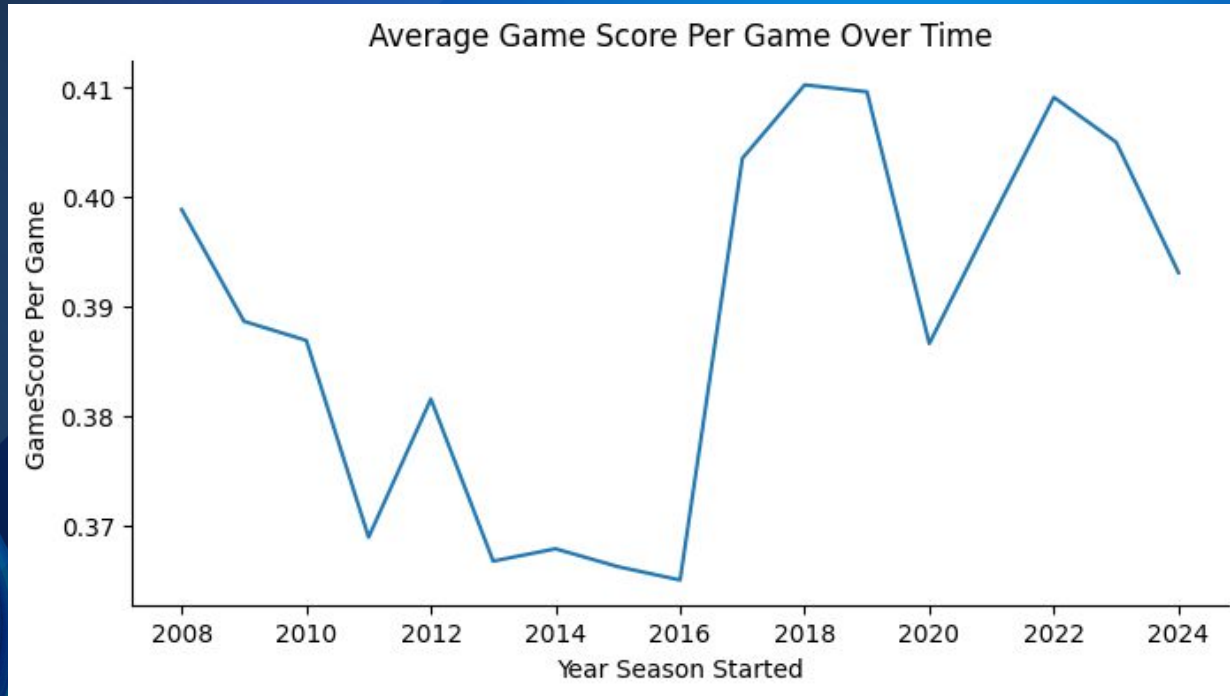
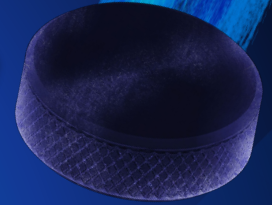
Games played is inconsistent and volatile, yet it does not show structural improvement over time—further supporting the idea that rising AAV is not tied to rising player durability or availability.

What is Game Score?



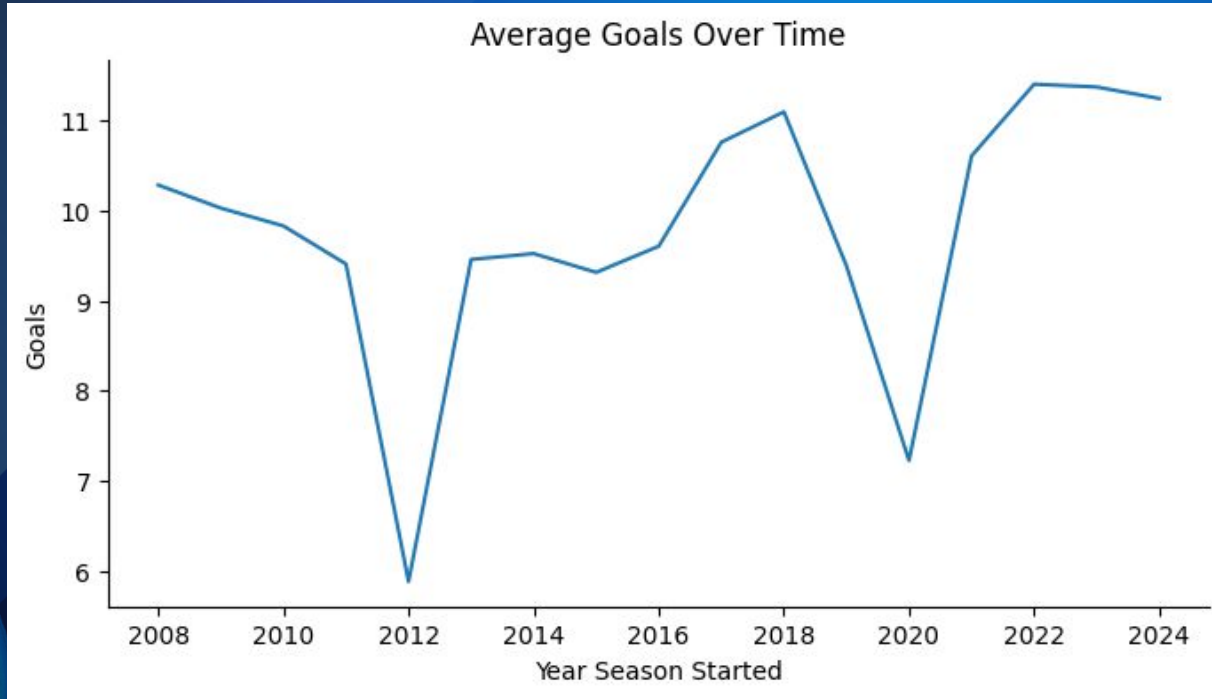
$$\begin{aligned} \text{Player Game Score} = & (0.75 * G) + (0.7 * A1) + (0.55 * A2) + (0.075 * SOG) \\ & + (0.05 * BLK) + (0.15 * PD) - (0.15 * PT) + (0.01 * FOW) - (0.01 * FOL) + \\ & (0.05 * CF) - (0.05 * CA) + (0.15 * GF) - (0.15 * GA) \end{aligned}$$

Average Game Score Per Game



Game Score per game remains **flat** despite rising AAV. Player effectiveness is not improving at the same rate as salary growth. This indicates a widening efficiency gap.

Goals Per Game



Goals fluctuate randomly year-to-year with no upward trend.

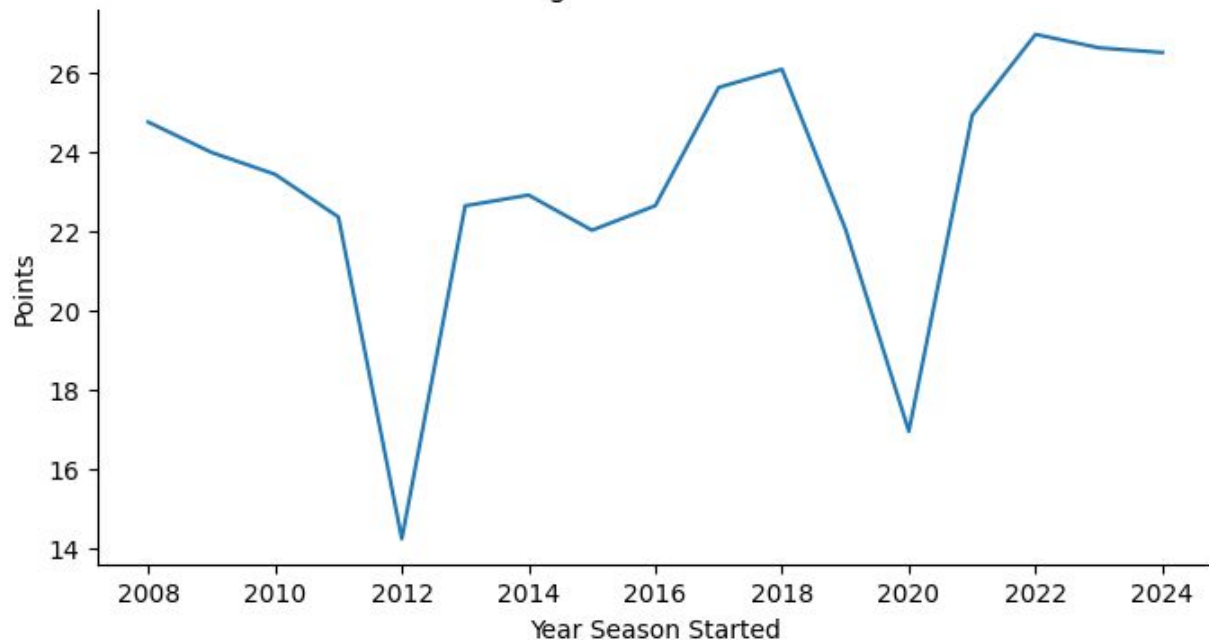
Despite this, these noisy stats continue to heavily influence AAV.

Teams are paying for past scoring even though it's volatile.

Average Points

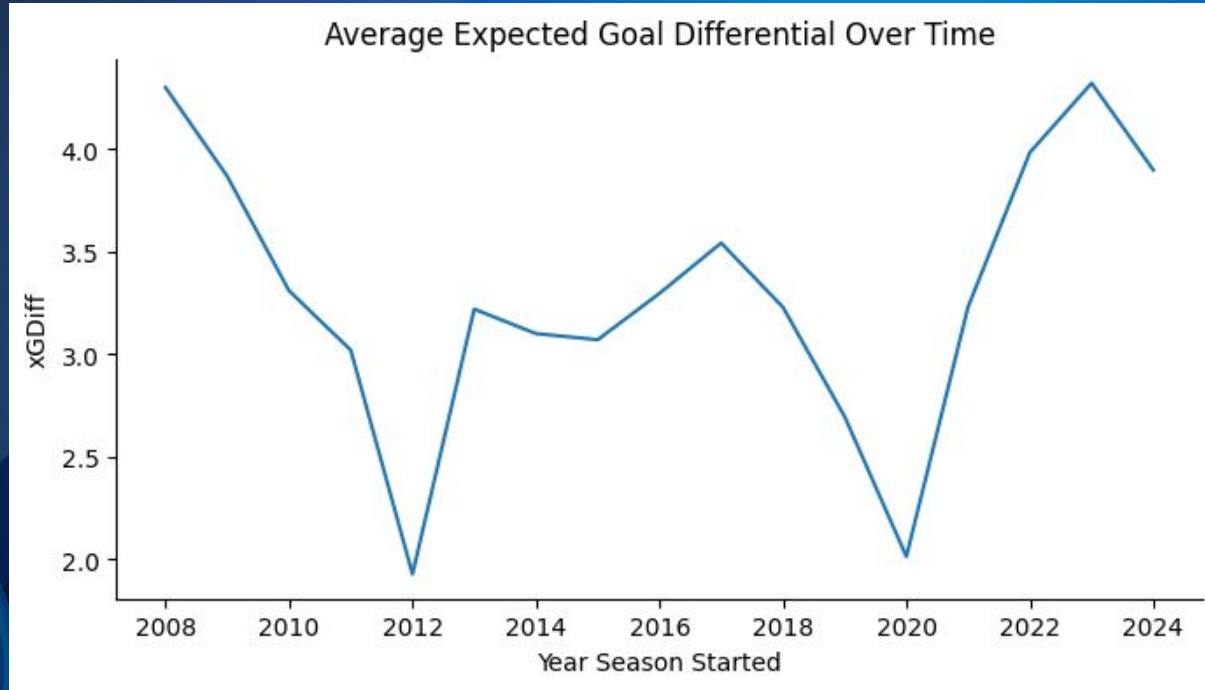
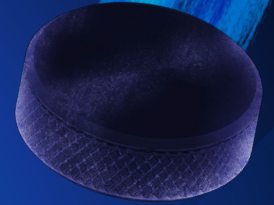


Average Points Over Time



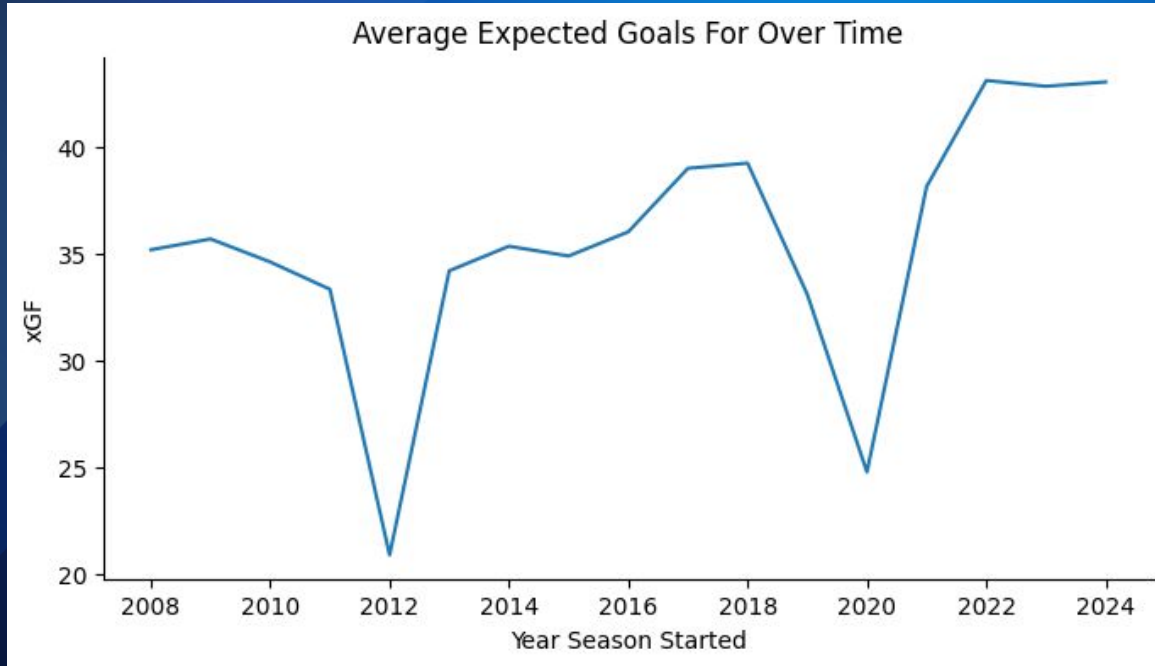
Points are a highly volatile metric with no long-term growth trend—yet teams heavily rely on them when determining contract value, contributing to inefficiency in cap allocation.

Expected Goal Differential



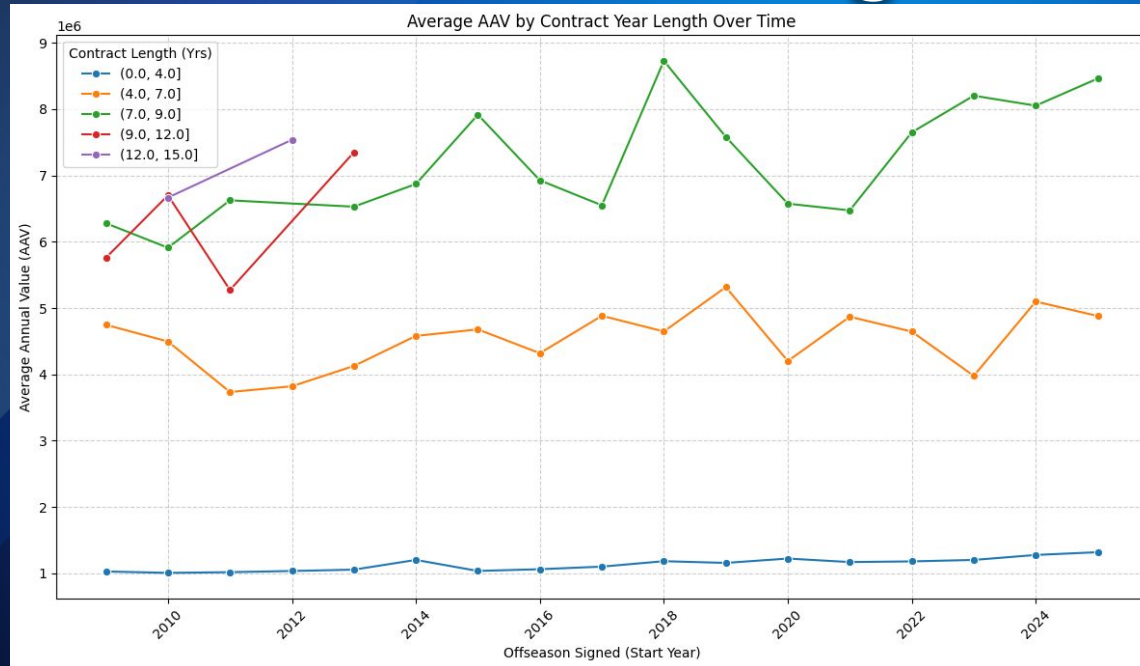
xGDiff is smoother, more stable, and more repeatable season-to-season than plus minus. It is a better indicator of future success rather than plus minus which is heavily influenced by surrounding talent

Expected Goals



xG is smoother, more stable, and more repeatable season-to-season than goals. This metric captures underlying talent more reliably than goals and is a far better predictor of future performance.

Average Annual Value Based On Length



AAV increases in longer contracts. Shorter deals is heavily weighed down by rookie deals, veteran minimums, etc. Orange line has most high profile deals, and green has max term modern deals.

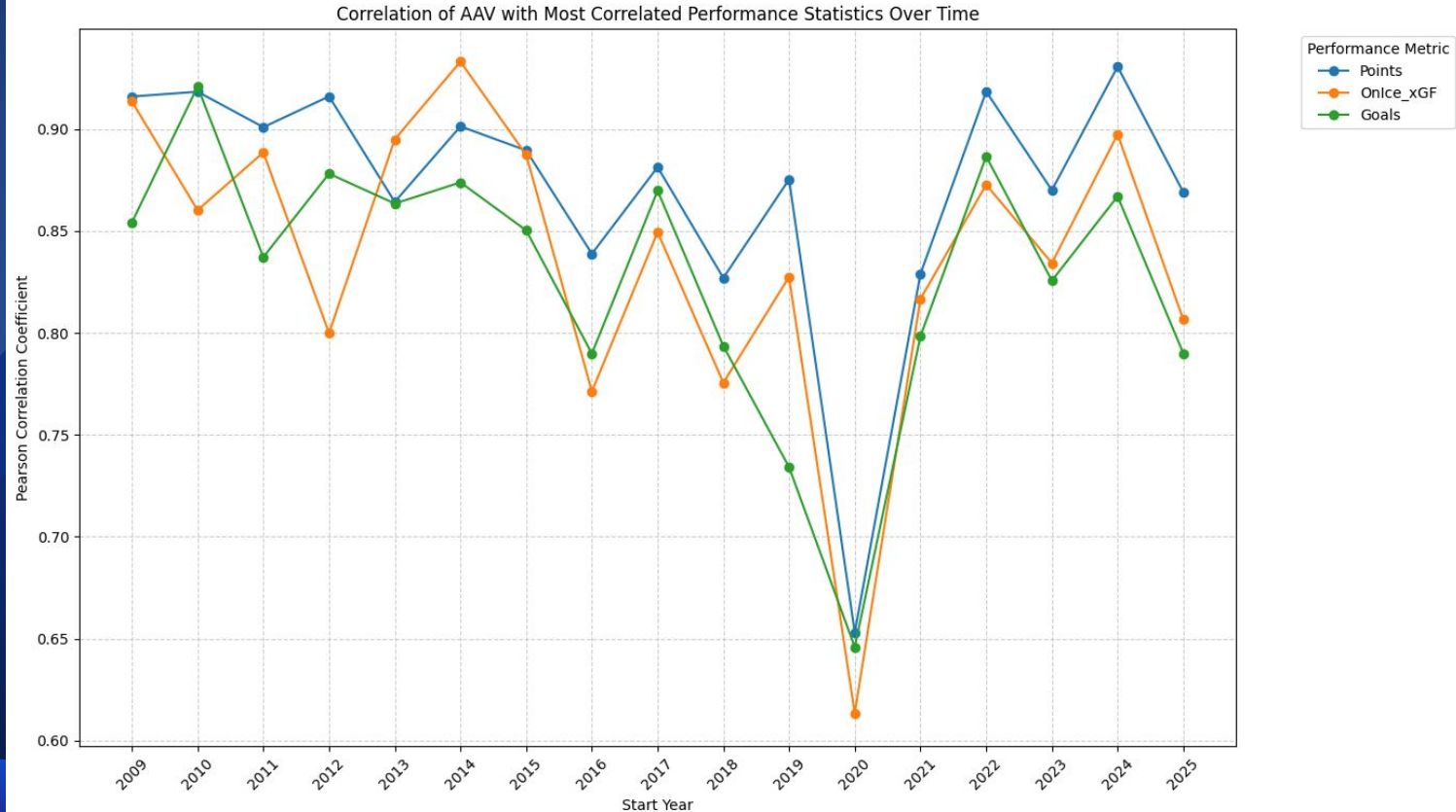
What Gets Players Paid?

Of 9 metrics commonly used to judge players, which of them correlates best with AAV?

Metrics:

1. GameScore Per Game
2. Goals
3. OnIce Expected Goals Differential
4. OnIce Expected Goals
5. OnIce Expected Goals Percentage
6. Points
7. Games
8. Points Per Game
9. Goals Per Game

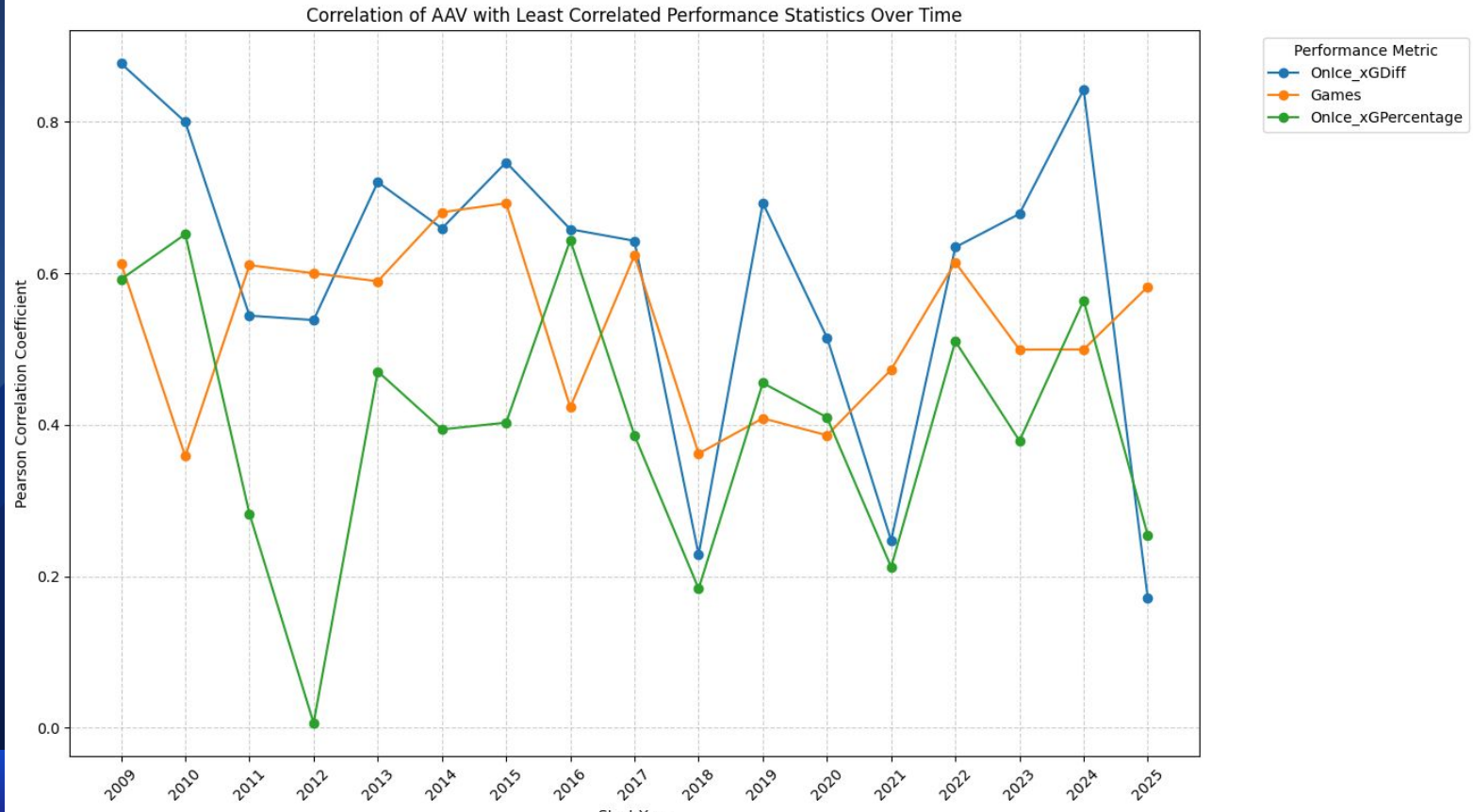
The Top 3



The Middle 3



The Bottom 3



What is Consistent Year-to-Year?

Correlation with stat in the next year

	Correlation	R-squared
Onlce xGF	0.805260	0.648444
Points	0.800931	0.641490
Points Per Game	0.773481	0.598273
GameScore Per Game	0.752491	0.566242
Goals	0.735634	0.541157
Onlce xGDiff	0.734067	0.538854
Goals Per Game	0.612574	0.375247
Games	0.601143	0.361373
Onlce xGPercentage	0.482520	0.232825

Correlation with AAV

Points	0.870547
Onlce_xGF	0.837795
Goals	0.828178
Points Per Game	0.782188
GameScore Per Game	0.738419
Goals Per Game	0.667420
Onlce_xGDiff	0.599714
Games	0.530318
Onlce_xGPercentage	0.399780

Key Findings

1

AAV is most strongly correlated with stats like points and goals.

These are highly visible but statistically volatile metrics in the long-term.

2

Future performance is best predicted by OnIce xGF.

This stable, repeatable metric is undervalued in contracts.

3

Teams are valuing pure offense.

Metrics including goals against have lower correlation with AAV, but this may be because they find it to not be repeatable



Conclusion

NHL teams consistently reward players for past scoring and dismiss metrics that are more consistent year-over-year

As a result, contract prices are rising faster than player value, creating a growing misalignment between spending and effectiveness.

Front offices might discount metrics that can be indicative of defensive play because of the elevated role of linemates in defense.

