NBA Macroeconomics: Scoring Inflation and LeBron James's Race to the Top

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Abstract

A record many considered untouchable was just broken nearly a month ago: the NBA's all-time leading scorer for regular season points. Points are considered the most important box-score like statistic that one uses to evaluate a player and compare players across teams, games, and time frames. But what happens when points no longer have the same value? Over time, average scoring numbers have fluctuated with peaks and troughs, almost like a business cycle. When average scoring is high, the relative value of a point in getting a team to a win is lower compared to when average scoring numbers are low. This paper explores the impact of said scoring "inflation" on how the top six all-time scorers managed to get their points.

1. Introduction

The NBA just experienced the once unthinkable feat: LeBron James passed Kareem Abdul-Jabbar to become the NBA's all-time leader in career points. LeBron is a decorated NBA player with MVPs and championships but this might just be the his most impressive career achievement. LeBron continues to defy the laws of aging as a professional athlete. At 38, he continues to hold a spot at the MVP table thanks to his elite scoring and play-making skills. He is truly one of one and continues to build his case as the basketball GOAT.

But, scoring is not the same thing as winning. Scoring is a means to the end. At its simplest level, winning in basketball comes from scoring more points than the other team; winning happens from either outscoring your opponent, limiting your opponents to scoring less than you, or some combination of the two. It's offense first, defense first, or a mix. In recent years, teams and players have demonstrated a propensity for the former; teams are scoring more points each night than ever before thanks to more players posting historically high points-per-game (PPG) numbers. A point is still worth the same amount, but in the context of today's NBA a singular point is not worth as much towards winning as it might have been say 10 years ago. If a player made one shot when the league average for points in a game was 100, then they would have

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contributed 2% of the total points scored. But if player scores one shot today when the league average is 114 points in a game, then they're only contributing 1.75% of the total points scored. Said another way, **there is scoring inflation in the modern NBA.**

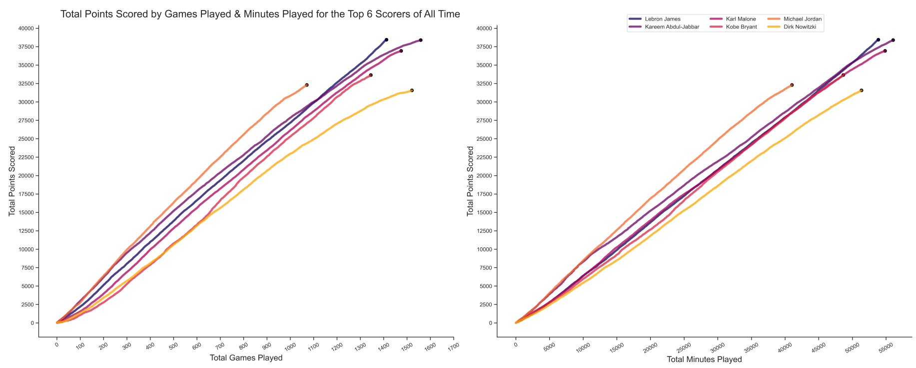

Figure 1: Aggregated point totals by games played and minutes played

2. Understanding Inflation and Applying it to Basketball

Borrowing from macroeconomics, inflation is a trend of increasing prices over time which impacts individuals through a decline in purchasing power. Decreasing purchasing power can be likened to a decrease in the value of your money; one dollar tomorrow will not be able to purchase as much as one dollar today due to inflation. This is a timely issue, as the US is currently experiencing high inflation for the first time in a couple decades. Inflation is measured by the year-over-year change in the consumer price index (CPI) which is a proxy for the price of a bundle of core goods in the contemporary economy.

$$\text{Inflation}\,(\pi_{t+1}) = \frac{CPI_{t+1}}{CPI_t} - 1$$

If we treat points as the same thing as a dollar in an attempt to equate the two systems (the economy and the NBA), we can try to come up with an appropriate comparable. Creating a comparable equation or method of adjusting points for the current scoring environment is essential to making the step from evaluating players just on their scoring to evaluating scoring as it could potentially contribute to winning. At the end of the day, the key assumption in this analysis is that winning is most important to both teams and players. We start with the CPI, which is quite literally an "indexed" measure of prices in the economy. For basketball, 100 points-per-game is an completely arbitrary number for the expected or normal amount of points a team should score, but it does have some centrality around the historic averages. With this in mind, we can calculate the deviation for this index when it comes to the league-wide average for total points scored in a game. This is how we can proxy for inflation in scoring.

$$\text{Total Point Index}\,(TPI_t) = \frac{PTS_t}{100}$$

This can serve as the indexed metric to track the movement in average team points per game over time. Using the TPI_t we can get a measure of inflation that is for all purposes equal to the macroeconomic definition.

$$\text{Scoring Inflation}\,(s_{t+1}) = \frac{TPI_{t+1}}{TPI_t} - 1$$

Now that we've established an understanding of inflation and created an applicable framework for basketball, we can apply the math to an analysis on the top all time scorers. LeBron breaking Kareem's record was something basketball fans saw coming with his averages this season, but such a seismic shift in NBA history prompts further analysis and investigation. The initial hypothesis I take for this piece is that recent (within past 5 years) scoring inflation in the NBA aided and expedited LeBron's timeline to break the all time scoring record. If we look at inflation-adjusted points, LeBron is expected to remain 2nd all-time in career total points.

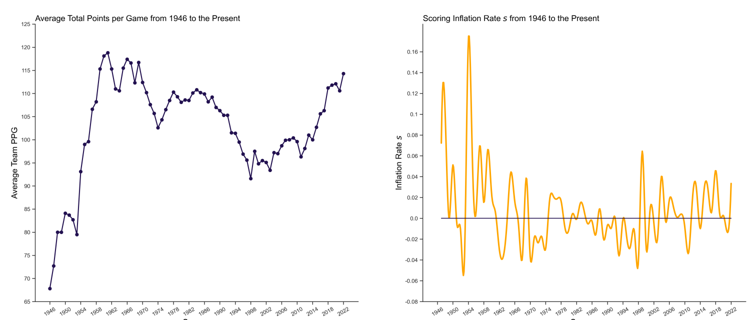

Figure 2: Average team PPG and the scoring inflation across seasons

3. Scoring Velocity

A precursor to adjusting points for inflation is studying the velocity at which these six players score. We consider scoring velocity to be the change in points from one night to the next. In other words, it is the rate at which a player's points per game increases. Instead of calculating the actual rate, we look at velocity from a visual perspective and examine if there is any visible upwards or downwards movement in a players nightly PPG. Figure 3 shows the points scored in each game the top six scorers played in their careers with an overlayed 82-game moving average for points scored.

Studying velocity like this helps us get a visual sense of at what point in a player's career do they make a push up the all-time scoring leader board. Figure 3 helps highlight a few interesting takeaways which suggest some "atypical" movement in LeBron's numbers. The conventional pattern in these charts would be a rainbow shaped evolution in PPG. As a rookie, a player might not get the same playing time or scoring opportunities as a veteran and therefore we would expect their PPG to be at the low end of all the values throughout their career. For players at the end of their career, we would also expect their PPG numbers to be at the lower end of the distribution given that their age might limit their ability to run the offense and score. Therefore, players should have their PPG peak during the middle of their career. Or, we could consider the middle of a player's career the point at which their PPG should peak.

A few of the six charts in figure 3 behave according to the dynamics discussed above. Dirk Nowitzki has the most pronounced career PPG rainbow, but the same shape appears in the charts for Karl Malone, Kobe Bryant, and Michael Jordan. On the other hand, Kareem Abdul-Jabbar has a PPG arch that seems to just trend downwards. He began his career scoring the most points per game and let that number come down as he aged. This is where LeBron shows atypical behaviour. He started his career with a sharp increase in PPG but then that tapers off. There is a steady decline in his PPG (save for some cyclicality) up until the 1200th game of his career. Here, the rolling average starts to trend upwards to a new all-time high for LeBron. His scoring is abnormal for this point in his career when comparing his career to the rest of the top six. Moreover, his scoring is abnormal for **his own career** given that his PPG numbers were steadily moving downwards until recently, within the last four seasons, where his scoring has exploded back upwards. This is where our research interest arrives: is his scoring explosion a product of his own efforts or is it aided by a scoring explosion across the NBA?

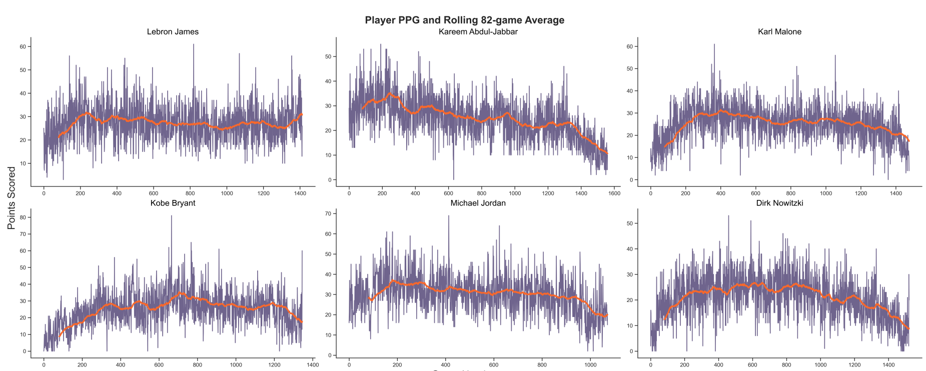

Figure 3: Player PPG velocity

4. Method A: Real Rates for Inflation Adjusted Scoring

We have already translated macroeconomic inflation (π) over to basketball through the Total Point Index (TPI) and the year-over-year change in this measure. Now we can incorporate this into our analysis of how a player's scoring evolves over the course of their career dependent on what the "scoring environment" is like. In other words, we can adjust PPG numbers in line with how scoring in the league is changing.

We first borrow a concept from macroeconomics to model the relationship in the change in league-wide scoring back to a player's change in points. We are going to use the equation for the real interest rate:

$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation}$$

$$r = i - \pi$$

For those who are not familiar with this equation, it is fairly straightforward. The math is basically saying that the actual interest rate or rate one might receive on an asset is the stated rate (the rate one is literally being paid out) minus the inflation from the same time period (the loss in purchasing power). The real interest during inflationary periods will be lower than the nominal interest rate because while one is getting paid a nominal rate i, π percent of that money's value is lost due to inflation. The opposite holds true during deflationary periods.

Moving this back to basketball, we will treat a player's points (PTS) during a season i as the interest rate term in the equations. Applying the math from above to basketball yields us the following relationship and equation:

$$\text{Real Points} = \text{Nominal Point Increase} - \text{Scoring Inflation}$$

$$\Delta_{r,i} = \Delta_{n,i} - s_i$$

We treat the Δ term in the above equation as the % change in points from the $i - 1$ season to the i^{th} season. This is based off of the average points per game from one season to the next. In a later equation we call on a variable Π which is used to represent the season average points-per-game a player had. This equation above gives us a hypothetical real point rate, which we can think of as the actual change in points from one year to the next compared to the nominal change which may be inflated thanks to league-wide scoring inflation. This gets us a step of the way there, but a real rate of change for a player's scoring does not actually adjust the total numbers they have scored over the course of their career. We need a way to translate these "real-rates" over to the actual career point aggregations.

This brings us to a final combination of everything discussed in this section thus far:

$$\Delta_{r,i} = \left(\frac{\Pi_i}{\Pi_{i-1}} - 1\right) - s_i$$

$$\text{Inflation Adjusted Career Total Points} = \sum_{i=1}^{I} G_i \times [\Pi_{i-1} \times (1 + \Delta_{r,i})]$$

The top equation is the same as the equation for the real rate for scoring increases. The only difference is the mechanics for finding the nominal rate are outlined with the variable Π representing the season average for points per game for a given player. The bottom equation is how the rate is incorporated back into calculating the total inflation adjusted points scored in a season. The equation takes the average points per game from the season before $(i - 1)$ and then multiplies it by one plus the real rate for scoring increases. Finally the "real" average points per game is then multiplied by the number of games that player played in season i. The process repeats for each season they played until the career total is calculated.

4.1. Working Through an Example

This math might not make sense from the first glance so working through an example should hopefully give better clarity to the ideas expressed above. We will look at LeBron James in the 2016 and 2017 NBA seasons, part of the famed LeBronto era.

Year	LeBron Avg Pts	League Avg Pts	TPI	Inflation	Games
2016	26.41	105.6	1.056	2.8238%	74
2017	27.45	106.3	1.063	0.6629%	82

Table 1: Method A applied to LeBron from 2016 to 2017

In this example we will calculate LeBron's real points from the 2017 season by adjusting the raw or nominal values for league-wide scoring inflation. We can see that across the league, teams are averaging an additional point per game as the average goes from 105 to 106 in these two years. We'll use the formulas above to calculate LeBron's real points for 2017:

$$\text{LeBron 2017 Real Points} = 82 \times \left[26.41 \times \left(1 + \left(\frac{27.45}{26.41} - 1\right) - 0.6629\%\right)\right]$$

$$\text{LeBron 2017 Real Points} = 2{,}237$$

The nominal total LeBron would have put up across 2017 can be found by simply multiplying his average PPG of 27.45 times the 82 games he played to get us a value of 2,251. Comparing this to the real value of 2,237 shows an inflation adjustment of only 14 total points. The adjustment here is miniscule and most likely has no real impact on LeBron's ability to break the scoring record. For that matter, he could easily put up the 14 point difference in a quarter if he wanted. Inflation adjusting his average PPG in 2017 brought down his nominal value of 27.45 to 27.27, a tiny difference in the grand scheme of things. And while this small difference might seem like there is no real value to inflation adjusting LeBron's numbers, the math here is completely in-line with expectations. LeBron averaged an additional point per game in 2017 compared to 2016 while teams across the league also scored an additional .8 points. One player represents at most 20% of a team's total minutes played on any given night (a lineup is made up of 5 players who could each play 48 minutes at most). Therefore, a league-wide increase of 1 point is not as big of a deal compared to a player increasing their scoring by a point.

4.2. Method A Applied to The Top Six Scorers

Player	Nominal	Real	Difference
Dirk Nowitzki	31560.0	31370.0	190.0
Kareem Abdul-Jabbar	38387.0	38549.0	-162.0
Karl Malone	36928.0	37230.0	-302.0
Kobe Bryant	33643.0	33504.0	139.0
Lebron James	38450.0	38070.0	380.0
Michael Jordan	32292.0	32551.0	-259.0

Table 2: Method A nominal and real point totals

Table 2 above shows us the career aggregate point totals for the top six all time scorers when we use Method A to adjust their nominal points for inflation. The values of a negative difference suggest that these players' real aggregate point total is greater than their nominal total. On the other hand, positive values suggest the nominal total is inflated and therefore is greater than the real total. Kareem Abdul-Jabbar, Karl Malone, and Michael Jordan are all players with negative differences which suggests that scoring deflation had an impact of their career totals whereas Dirk, Kobe, and LeBron have positive differences, suggesting scoring inflation benefiting their totals. It goes with a casual understanding of basketball that the three players who defined their careers in the 21st century all have benefited from scoring inflation.

Table 2 does confirm that LeBron would not have passed Kareem if we looked at his real scoring numbers instead of nominal totals. Kareem's real total is 38,549 whereas LeBron's total is 38,070, meaning he is 479 points short of passing Kareem at the time of this writing. Extrapolating this to the value of these points, the nominal points LeBron has aggregated across his career are worth 479 points less than Kareem's career aggregation. LeBron has stuffed his raw point total to pass Kareem, but this analysis suggests the value of those points are worth less than the points Kareem put up.

Why should one care about this? LeBron broke the record fair and square, there is no debate about who the NBA's all-time leading scorer is. Being at the top of the all-time scoring list is one thing, but, as established earlier, points are just a means to winning a game. If a player's points are "worth less" in one time compared to another, then it could be reasonably understood that their points achieve less in accumulating wins in comparison. Analyzing greatness needs to account for the fact that points are just means to an end, and that link is equal in all periods.

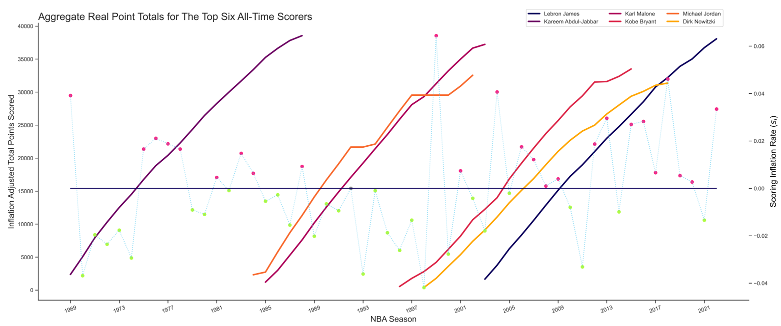

Figure 4: Career Real Points with the Inflation Rate

5. Method B: Present Value Modeling and Discounting Points

The approach listed above as method A is more consistent with how macroeconomists might look at how inflation impacts the value of investments. However, the issue with applying that method over to basketball is that it limits the ability to look at impacts on an individual game level. Method A is based on season level data / averages which are then extrapolated out to an individual game level. This second method is our attempt to create a framework or approach that we can apply on an individual game level for each player. The game-level approach is of interest since it will allow us to look at the precise game where one player surpasses another player for their career total points scored.

This method is based on present value modeling from finance. Time value of money is one of the most fundamental concepts in financial analysis and it is based on the idea that money loses value over time. The present value of something in time t is not the same as its future value at time $t+1$. The reason for this is that money invested today could earn an expected return that would give us a greater sum of money in the future. The return is variable and the choice for what value to use is up to the individual who is making the investment decision.

To exemplify this concept if it still does not seem clear, let us hypothetically say we are faced with either receiving $1000 today or $1000 in a year. In either case, we are guaranteed to receive the money so we do not have to worry about the risk we do not get that $1000 in the future. If we take the money today, we can invest it in something with a specific return: for example we could buy a $1000 bond with an annual coupon of 5%. This would allow us to take the $1000 today and turn it into $1050 in one year. On the flip side, we could generate a total cash position of $1000 in a year from now if we invested say $900 into something that pays an expected return of 11%. Regardless of how we choose to invest our money in the present, the simple fact that taking the same amount of money in the future is worth less due to the opportunity cost of not being to have your money make money in the present.

Taking this back to the modeling, discounting is the method for converting the future value of an asset back to the present. The formula for discounting is outlined below. This equation states that the present value of an asset is equal to the future value of an asset divided by 1 plus the rate of return r. We raise this denominator to the power of t because the return may occur t times between the present and the end period T we're looking at.

$$\mathrm{PV} = \frac{\mathrm{FV}}{(1+r)^t}$$

So how does this relate back to basketball? For this analysis we convert the same relationship between present and future value to "real" versus "nominal" points and set the discount rate equal to the scoring inflation rate (s_i). The "real" and "nominal" points occur for each game g in each season i, whereas the scoring inflation is calculated across the entire season i. One important call out here is that all this analysis is retroactive given that we are going back in time to discount the nominal points based off the scoring inflation rate which we find out at the end of the i^{th} season. If we wanted to make this analysis more forward looking, we could make our inflation rate based off the value from the end of season $i-1$ instead of making everything "contemporary" during season i.

$$\pi^r_{g,i} = \frac{\pi^n_{g,i}}{1+s_i}$$

Note: We use $\pi_{g,i}$ to represent points scored from an individual game. We used Π_i represent the end-of-season average points scored in an individual game, based off all the games the player played.

Figure 5 shows us the difference between player's nominal (π^n) points scored in a game versus their real (π^r) points scored, as derived through discounting the nominal points by one plus the scoring inflation rate for that season. The dashed horizontal line represents the 0-axis, meaning this is where the nominal points equal the real points and therefore the difference is zero. This is the case in the first year for each player we are looking at since we set the π^r during their base year equal to π^n. If the equality persists, this means that there was no inflation

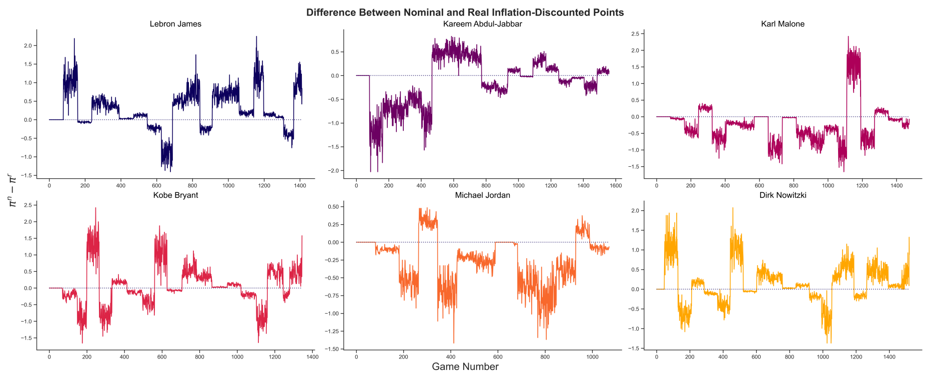

Figure 5: Difference in nominal versus discounted points

in that year and therefore the nominal equals the real. Values that are **below** the 0-axis represent games played where there was scoring *deflation*, meaning the inflation rate is negative and the denominator in the relationship between π^r and π^n is less than 1. The opposite also holds true, meaning that values **above** the 0-axis represent games played where there was scoring *inflation*.

This image allows us to compare the eras and the magnitude of discounting on each of the top six scorers we are analyzing. First, on the note of overall career analysis, players like Karl Malone and Michael Jordan played a majority of their career in *deflationary* eras as evidenced by the majority of their difference values being negative. On the other hand, players like Dirk and LeBron played a majority of their careers in *inflationary* eras with most of their games occurring above the 0-axis. Finally, both Kareem and Kobe seem to have split their careers across both *deflationary* and *inflationary* eras with a near even split of games occurring above and below the 0-axis.

The magnitude of discounting is also an important call-out when looking at this plot. Say players A and B both have games above the 0-axis, but player A may be much further away from zero when compared to player B. While both players A and B have nominal points that are inflated, it suggests that player A's nominal points are much more seriously impacted by the scoring inflation during their era compared to player B. All else equal, the closer the value is to the 0-axis, the less responsible inflation or deflation is for their nominal points per game.

Table 3 presents the average difference in nominal versus real points during periods of deflation and inflation along with the count for the number of observations during the periods. We define a period as deflationary in this analysis when $\pi^r > \pi^n$, and a period as inflationary when $\pi^r < \pi^n$. The table shows us that Kareem Abdul-Jabbar experienced the most significant deflationary impact on his scoring throughout the games played in a deflationary environment. In other words, Kareem's real points per game during the 863 games played in a

	Mean		Count	
Player	Deflation Δ	Inflation Δ	Deflation Δ	Inflation Δ
Dirk Nowitzki	-0.314692	0.417398	531	936
Kareem Abdul-Jabbar	-0.445935	0.314685	863	614
Karl Malone	-0.430954	0.666035	1070	242
Kobe Bryant	-0.402176	0.485370	596	675
Lebron James	-0.348279	0.505312	345	989
Michael Jordan	-0.394555	0.242484	771	141

Table 3: Method B inflation and deflation impact on PPG

deflationary environment were on average .44 points higher than the nominal points per game. On the other hand, Karl Malone has the greatest impact during an inflationary environment where his average nominal points per game were .67 points greater than the real points due to inflation. Nonetheless, Malone played the second fewest amount of total games during an inflationary environment at only 242 out of his career 1,312 (not including his rookie season).

When looking at players who played the majority of their games in an inflationary environment, it is clear that LeBron leads all others in this top six comparison. LeBron has played 989 games in an inflationary evnironment compared to 345 in a deflationary environment, meaning he has played 74% of all his games in an inflationary environment (not including his rookie year). Moreover, the impact inflation has had on his scoring during this 989 games is the second largest out of the top six. For LeBron, we can understanding this analysis in the following manner: during the 989 games he has played in an inflationary environment, on average the nominal value of his points per game is .51 points greater than the real value. If we multiply the number of games played in this environment by the average impact, we get an additional 500 points due to inflation. This is a gross addition, since we do not account for points that are of more value in a deflationary environment.

A net impact to LeBron would have him at 379.6 fewer points than his nominal aggregate would show. If we apply the same math to Kareem, we see a net impact of 191.6 more points than his nominal aggregate shows. The spread between his real aggregate and LeBron's real aggregate at this point would be shown as the difference between their two adjustments: 191.6 - (-379.6) = 571.2 total points. In other words, LeBron would be 571.2 real points short of breaking the scoring record at the time of this analysis. If we assume a real points-per-game average of 25 for LeBron in 2023, then it would take him an additional 22.8, rounding to 23, games to break the record in the discussed inflation-adjusted terms. Using a higher real points-per-game average of 30, it would take him an additional 19.04, rounding to 19, games to break the record. These two scenarios both show that LeBron breaking the record in real terms would most likely occur **next** season instead of during the current season. At the time of writing, he is currently out with a foot injury and will most likely not come back during the regular season.

One important call-out from table 3 is the deflationary impact on Michael Jordan's career numbers. Jordan played 771 out of his 912 career games in a deflationary environment, represent 84.5% of all his games played outside of his rookie year. To start, Jordan is the only player on this list with fewer than 1000 total non rookie year games played, and he represent the player with the largest portion of this time period played during a deflationary environment. Looking at the real inflation-adjusted point spread compared to his nominal total, Jordan's real points are 270 points greater than his nominal aggregate. His presence in the top six scorers of all time with so few games played compared to the other five already proves his status as an incredibly efficient scorer, but when accounting for the added difficulty in scoring during his career we see his contributions as worth even more.

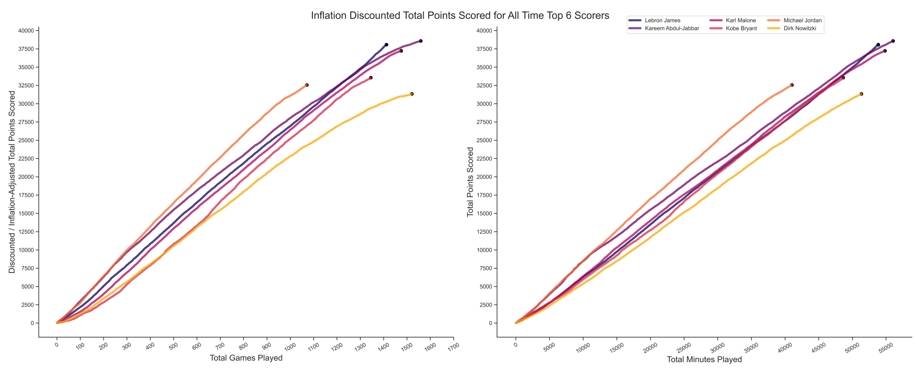

Figure 6: Aggregate total inflation discounted points

The visual in figure 6 gives us a better representation of all the analysis discussed above. The chart on the left shows that LeBron's inflation-adjusted aggregate points are slightly less than Kareem's. However, the two curves are very close on the y-axis, but LeBron still has plenty of games left to play when compared to Kareem's career aggregate. On the right we explore the relationship between total minutes and total inflation-adjusted points scored. Here is where the two curves are much closer in terms of their x and y axis positioning. LeBron may have played nearly 150 fewer games when compared to Kareem, but their career minutes are roughly 3600 minutes apart. If we assume LeBron plays an average of 36-minutes a game, he's only 100 games behind in terms of minutes.

6. Conclusion

The purpose of this analysis is not to discredit LeBron's achievements or cast doubt on his legacy. Growing up watching basketball, our understanding of the game was shaped by heuristics for what convention treated as greatness. But across the past five years, basketball has dramatically evolved and potentially to a point where the heuristics formed over decades of play are no longer relevant. Put another way, the NBA has changed in recent years to a point where we cannot compare play from other eras directly to the present without some kind of adjustment. The NBA in 2023 is an apples to oranges comparison to the NBA from 2013, for example.

LeBron James continues to defy our expectations and understanding of a conventional basketball career: he is anything but conventional. At age 38, he's scoring at his per-game all-time high. But, he's not alone in this fact as several players across the NBA are putting up career numbers this season as the league continues to experience what we call scoring inflation. A host of factors are responsible for the league-wide scoring inflation, but most notably are the importance of the three-pointer in teams' offenses and increases in the pace of play. Teams are opting for a "shoot and get back on defense" style of offense instead of trying to set up the half-court offense, play downhill and drive, or fight for offensive rebounds. This style of basketball has opened up numerous scoring opportunities and jacked up a game's tempo, allowing for more points to be scored on average.

While the contents and makeup of a basketball game may have changed, the game itself has not changed. The objective is still to win, and that is done by either scoring more points than the opponent or preventing the opponent from scoring more points than you. These objectives may sound like the same thing, but at the end of the day it can be boiled down to having better offense than your opponent's defense while having better defense than your opponent's offense. Winning is determined by points at the end of the game, and if more points are being scored by both teams on average, then individual points from a player count less towards the overall total necessary to win. This is where the idea of scoring inflation is fundamentally sound, as there is a loss in winning-power for points in environments or eras of high scoring inflation. And when it comes to considering a player's all-time scoring and how it will impact their legacy, distilling meaningful contributions from raw values is a step this paper seeks to make.

We use two frameworks translating macroeconomic concepts over to basketball to adjust nominal point totals for what we define and capture as scoring inflation (s_i). The first method we used adjusted the nominal rate for average PPG (Π_i) changes for inflation to get a real rate. The second method we use discounts the nominal value for points in a game ($\pi^n_{g,i}$) by one plus the scoring inflation rate to get a real value for points in the same game.

Applying the two frameworks on the top six all-time leading scorers in NBA history both show that in real terms LeBron James has yet to surpass Kareem Abdul-Jabbar in career total points. Using Method A, LeBron is short by 479 real points. Using Method B LeBron is short 571 real points. Being short real points has two implications for LeBron. First, LeBron needs to score an additional 479 to 571 inflation-adjusted points to surpass Kareem according to these two frameworks. Secondly, the value of LeBron's current nominal career totals are worth approximately 479 and 571 fewer points compared to Kareem's totals, respectively. Worth is an ambiguous term here, but we consider it to mean that he would need to score additional 479 or 571 points in order to have had the same impact on winning through his point contributions as Kareem had throughout his career.

Scoring inflation is an emerging topic in the field of basketball research and analytics engineering. The purpose of this paper is to engineer new ways to understand the history of the game and to provide a new lens with which we can discuss greatness. This paper is by no means a complete and exhaustive discussion of how inflation can be modeled in basketball. Any shortcomings, feedback, or criticism on the work we conducted would be greatly appreciated. Thank you for taking the time to read our analysis and explore our findings.

7. Appendix

7.1. Point Decomposition

One important driver of scoring inflation across time is the creation and utilization of the three point line. The NBA first instituted the three point line during the 1979-1980 season, meaning Kareem Abdul-Jabbar played the first 10 years of his career without this additional scoring opportunity. The three pointer has become a staple of the modern NBA offense and is a huge reason for why scoring is inflated. For that matter, teams are generating an additional 50% more points per possession in each instance of a made three pointer instead of a made two pointer.

Along with the three pointer, free throws are another source of scoring inflation. In an earlier work, we explored the impact of free throws on inflating a players PPG numbers. Free throws are a product of officiating, and officiating is dictated by the rules of the current NBA environment. Rules have changed over time and accordingly the rate at which players take trips to the line has evolved too. Certain moves are legal in certain periods (e.g., hand-checking) and in other eras the same move is ruled illegal. Considering this in our evaluation means there needs to be some discretion as to where points are coming from during a period of inflation. This allows us to be more precise as to whether the inflation is having a direct impact or not, as a player scoring more two-point jumpers in an era where the three pointer is more common might not be a product of the scoring inflation discussed.

The following six charts show a percentage breakdown (decomposition) of how a player got their points during each season they played. The charts are stacked bar graphs where the values must all add up to 100%.

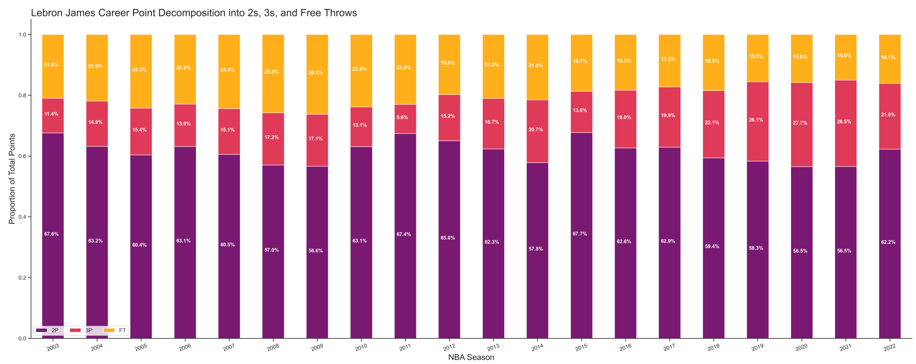

Figure 7: LeBron James point decomposition

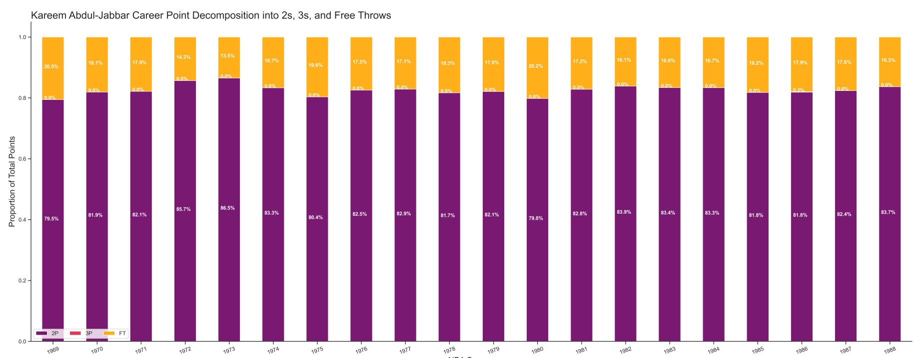

Figure 8: Kareem Abdul-Jabbar point decomposition

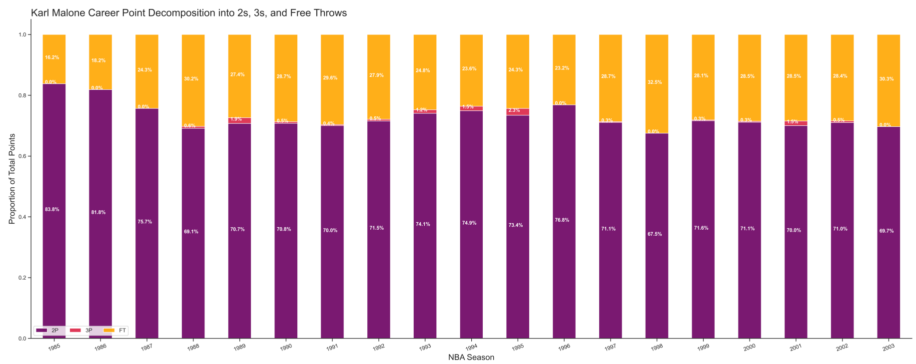

Figure 9: Karl Malone point decomposition

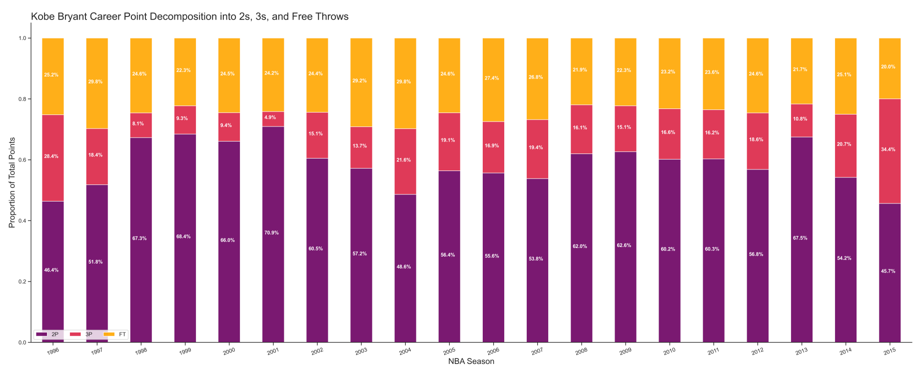

Figure 10: Kobe Bryant point decomposition

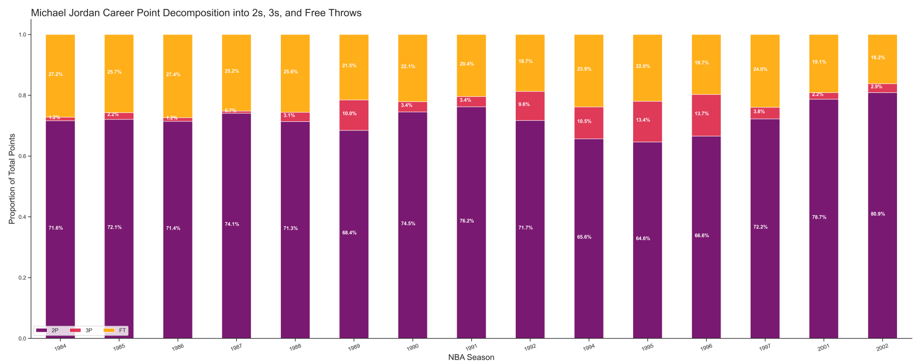

Figure 11: Michael Jordan point decomposition

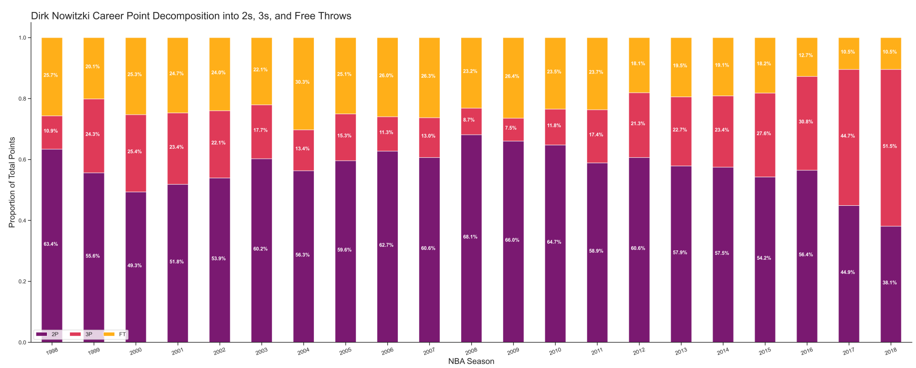

Figure 12: Dirk Nowitzki point decomposition

7.2. Data Credits

The data used in this paper is from the NBA Python API and Basketball-Reference. All the individual player data and gamelog data is from the NBA Python API. We used the following modules to access player data: playergamelog from nba_api.stats.endpoints and SeasonAll from nba_api.stats.library.parameters. The league average data is provided by Basketball-Reference and can be access via the following link: https://www.basketball-reference.com/leagues/NBA_stats_per_game.html.