**A Fixed Income Framework for NBA Contracts, Picks, and Trades**

Basketball

1. **Abstract**
   1. **Introduction**

In the last decade, there has been significant development in the analytics of player performance in the NBA. However, translating player performance to front office valuation of contracts, draft picks, and trades has yet to be done using a holistic framework, whereby we can value all of these in relation to one another. By borrowing concepts from financial valuation, we can model these as facsimiles to fixed income securities.

The purpose of this analysis is to give NBA general managers and front offices a systematic way to value all of the different instruments that they come into contact with. This is an essential question, as the wrong trade or contract for a given player can severely hamstring an organization for many years.

* 1. **Methods**

In order to have a standard metric by which we can give a valuation for each of the different “securities” that we are covering (contracts, draft picks, and trades), we will use dollars per win shares (WS). The choice of win shares is perhaps arbitrary and other player valuation metrics maybe be substituted, but this will suffice for the purpose of this analysis.

We will value draft picks as an expectation of the win shares contributed by a hypothetical player (as a function of the distribution of historical win shares). These can be considered as an equivalent of a bond future, while player contracts can be thought of as extendible bonds, a fixed income product with an embedded option. The front office can be “short” on the option (player option), while being “long” other options (team option). The “cash flows” are the dollars per win share that a team is able to receive from a player, which can be roughly modeled by their age, position, previous performance, and other quantitative metrics.

* 1. **Results**

We will be looking at NBA analytics, draft, contract, and salary data from the 2004 season through the 2022 season. We will be using NBA player analytics and draft data from Basketball Reference, while the salary data will come from Hoops Hype. We will use Monte Carlo simulation and lattice modeling borrowed from quantitative modeling of financial derivatives to determine values, since the optionality on the contracts will be path dependent. We will give a number of case studies of recent trades, draft picks, and player contracts to help build an intuitive understanding of this methodology.

**1.4 Conclusion**

The conclusions we hope to draw from the paper are whether or not this sort of analysis can give NBA teams a real basis in giving out contracts and trades. Often times, it appears that players and trades are made to simply appease disgruntled players or to buy front office executives additional job security. If the theory matches reality, then the aforementioned case studies will give a good estimate of value.