How Much of Your Career is Determined by Where You Start?

Research Proposal

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Introduction

Every year an estimated 4.3 million people enter the labor force in the U.S.[1] This project aims to examine the long term impact of variation amongst workers starting firm quality. We will attempt to accomplish this using professional sports league entry drafts as a pseudorandom trial. Gaining a better understanding of this impact will give individuals looking to enter the labor force more information about the returns to activities correlated with firm placement. The activities may include schooling, skill development, and pre professional work experience.

[1] The value is approximated using the number of individuals turning 18 in a given year and assumes that the number of individuals entering the workforce at an older age is approximately equal to the number entering nonlabor activities. Data is from the 2020 census (https://data.census.gov/table?g=010XX00US&d=DEC+Demographic+Profile).

Literature Review

While there is sparse literature examining this topic from the viewpoint we are utilizing, there is a moderate amount of separate work exploring early career impact, and the impact of good management and team construction on team performance. The intersection of these topics will serve to guide us in development of our a priori model.

While the impact of initial professional experiences varies widely across professions, countries, and individuals, prior literature shows a stark difference in outcomes at the aggregate level. Kondo (2006) found a 39 percentage point difference in the likelihood of an individual having regular full-time employment between those who were offered provisional employment and regular employment upon graduation. The results remained significant when utilizing a probit model and controlling for factors such as educational background, age, gender, and local job opening ratios.

Raelin (1980) utilizes a highly complex model for its time in order to show the relationship between early career factors such as job satisfaction and aspirations, mid-career factors such as mobility and stability, and late career measures of occupational status[2] and wages. After controlling for observed factors there remained a stronger and more significant relationship between early career characteristics and late period work experience. Although the numerical results are potentially dated and subject to the challenges posed by survey data, the findings aid the credibility of our approach.

Perhaps the greatest support for our thesis is Arcidiacono et al. (2017) which utilized scoring data across NBA lineups to estimate the productivity spillover in team production. This

[2] Measured using the Duncan (1961) Index. This index is ordinal, runs from 3 to 96, and is based on the educational requirements and economic rewards of an occupation. (Raelin pg.45)

spillover is modeled as the change in possession outcomes when a player's scores are exchanged with the average players. Despite finding strong evidence that productivity spillover contributed to team success, Arcidiacono found that worker compensation is largely determined by individual performance with little weight given to spillovers. The findings of Kondo (2006) may imply that entering workers may benefit disproportionately from the boost in performance these spillovers give them during such a critical time.

The effects of coaching and team performance on player development may remain ambiguous due to competing factors however. Lefgren et al. (2014) explores NBA coaches' exhibition of outcome biases by comparing the rates of starting lineup changes after a narrow loss compared to a narrow win. They did not find any correlation between observed coaching factors such as experience and tendency towards outcome bias, which hinders any conclusions one may wish to make. The effect of increased variance in lineups is also difficult to predict the effect of a priori. As it may provide otherwise unencountered opportunities, or disrupt the settling in process.

There is a mountain of literature such as Jacob and Lefgren (2004) examining the lack of impact of teacher training and development. We believe that although coaching and teaching share similarities there are exogenous factors that significantly alter the impact of the two professions.

One of the potential confounding factors for our model is “tanking” or intentionally losing games in order to secure a better draft position. Fortunately Price et al. (2010) shows evidence that in situations where the marginal effect of changing position is constant, teams are unlikely to tank. In the NFL this holds true, and outside of cutoffs such as being within the bottom four the NHL is similar.

Data

We will utilize NFL and NHL draft, player performance, and team performance data that has been scraped from sites such as CapFriendly, Spotrac and Sports-Reference. The years of interest are 2012-2022 for both leagues. Table 1 and 2 show summary statistics for each leagues

Table 1: NFL Summary Statistics

Round	Mean Career Length	Standard Error	Mean Salary	Standard Error
1	4.531	0.266	7869461	137832
2	4.245	0.240	5098231	135660
3	3.923	0.256	4943038	114879
4	3.492	0.208	3025509	84719
5	3.659	0.251	3150005	101931
6	3.438	0.232	4674161	153421
7	2.622	0.198	4384933	142004

Table 2.a: NHL Summary Statistics

round	Mean Career Length	Standard Error
1	12.158	0.244
2	10.224	0.228
3	9.701	0.253
4	10.093	0.272
5	9.646	0.319
6	10.027	0.336
7	9.880	0.340
8	10.919	0.426
9	10.250	0.506
10	10.370	0.717
11	7.875	1.001
12	9.667	1.909

The dataset we are using does not include the round players were drafted in, only the overall pick so round is calculated by grouping based on number of teams in the relevant year.

Table 2.b

Round	Mean Skater Salary	Standard Error	Mean Goalie Salary	Standard Error
1	3603849	7163	4048096	33177
2	2355930	9221	1859267	21425
3	2320601	9724	2498216	20919
4	2038144	11277	1901651	24274
5	1822245	11921	1959109	37661
6	1988060	11792	1696901	26995
7	2068000	14538	3102922	55729
8	2261230	24297	3916667	448630
9	3011307	33741	3909439	45216
10	1938677	27952	1875000	24777
11	nan	nan		
12	689500	11117		

Empirical Strategy

In order to capture the effect of the starting firms performance on long term career results we will utilize a regression discontinuity approach. Our model will plot normalized career earnings against the position drafted. We are assuming that a player picked at the end of one round is on average nearly identical to the player taken at the beginning of the next round. One will go to the team with the best record in the previous season, while the other goes to the team

with the worst record. This allows us to control for most of the unobserved values that would otherwise be present.

In order to control for factors such as team positional need, as well as for the sake of fair comparisons we will be standardizing our outcome variable on a positional basis. For the sake of restricting the scope of our analysis we have made the following assumptions, the relaxing of which is a suitable area for future work:

1. Trades involving draft picks are uncorrelated with our observed values. $E(T|X,Y) = 0$[3]
2. While team needs may lead to more variance in player ability at adjacent picks, the overall effect will be insignificant.
3. Team draft position is a function of the quality of players and staff
4. All Teams have equal likelihood of drafting players who underperform/overperform[4]

   $P(d_{b,B}|t_i) = \overline{P(d_{b,B})}$[5]

We plan to test these assumptions where possible for the sake of thoroughness. Our primary model will exhibit the following structure:

$$y_i = \beta_0 + \beta_1 x_i + \alpha Z + \mu$$

Where y_i is normalized career earnings, x_i is position drafted, and Z is a vector of controlled effects.

[3] Where T is a dummy for a trade occurring, X is a vector of player characteristics, and Y is a vector of Team characteristics.
[4] While there is much belief that better team management leads to more boom opportunities and less busts, we will not be exploring this relationship at this time to preserve the focus of this paper. Future work using projected draft position as an Instrumental Variable to avoid this correlation may prove fruitful.
[5] Where t_i is any given team and $d_{b,B}$ represents a boom or bust draft pick.

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Appendix

Code and data files used for analysis can be found here (https://github.com/bishopcurtisj/ECN5030-Research-Project)