# Ec 980FF Final Paper Summary

Buddy Scott

10/15/2020

This paper will analyze the potential ramifications of the ongoing COVID-19 pandemic on the finances of the NBA and the market for its players. The NBA salary cap is the mechanism that effectively equilibrates supply and demand for players. The salary level is set based on Basketball Related Income (BRI). NBA Commissioner Adam Silver revealed in May 2020 that ticket sales for in-person fan attendances comprises an estimated 40% of the NBA's revenue. The NBA's revenue is roughly split 50-50 between players and the owners of these teams. Figure 1 shows how the players' and owners' split of BRI would decrease according to this projection by Silver from $4 billion to $2.4 billion. If this is the case, the league might have to withhold an increased percentage of players' salaries in escrow for the upcoming season to finance the league's operations, potentially leaded to heavily contested debates at the bargaining table of an updated Collective Bargaining Agreement.

The two pressing economic problems this paper will address are the league's potentially inaccurate forward guidance provided to teams about salary cap levels for the upcoming season, as well as potential inequalities emerging from teams' varying levels of cash flows and spending power that could potentially harm competitive balance in a zero-sum league.

Figure 1: Potential BRI Drop in 2020-2021 Season
Commisssioner Adam Silver projects ticket sales comprise 40% of BRI

| BRI | Total | Players | Owners |
|---|---|---|---|
| 2019-2020 Season | $8B | $4B | $4B |
| Projection for Next Season With No Fans | $4.8B | $2.4B | $2.4B |

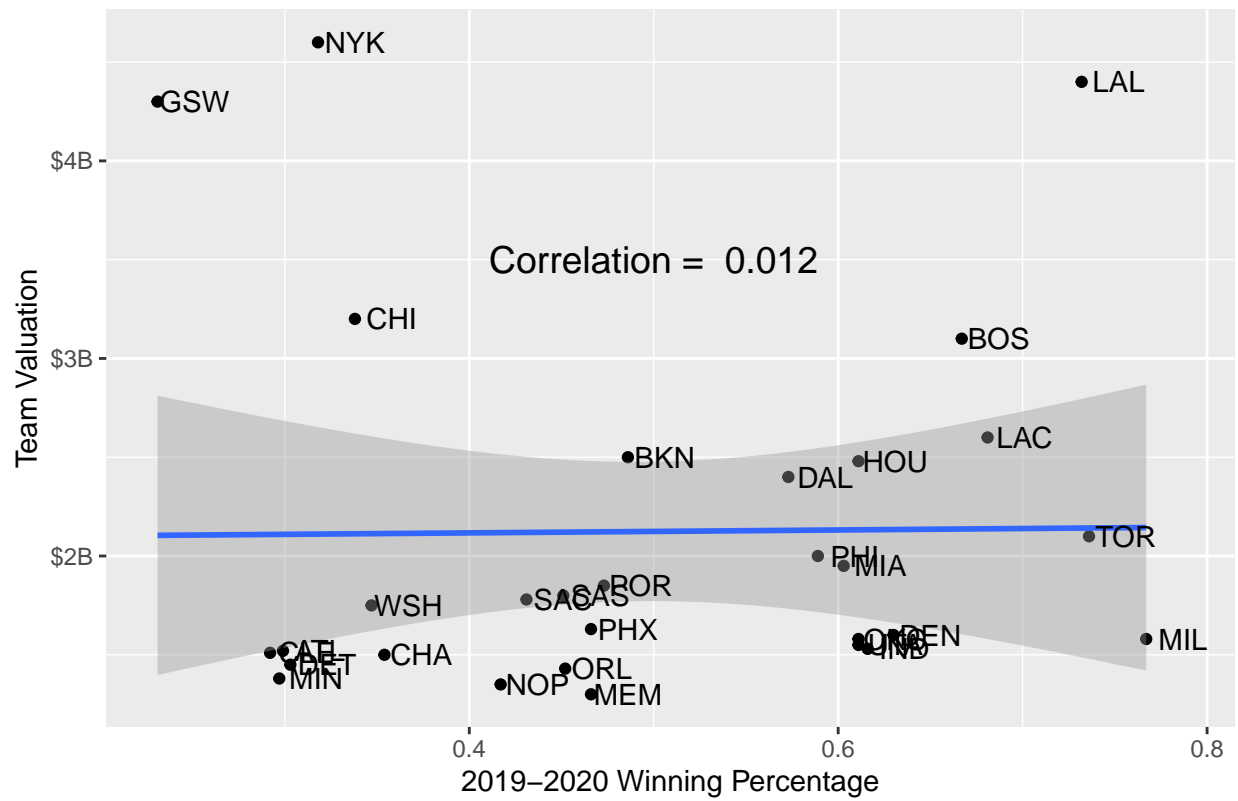## Figure 2: Team Valuation vs. 2019–2020 Winning Percentage

Correlation = 0.012

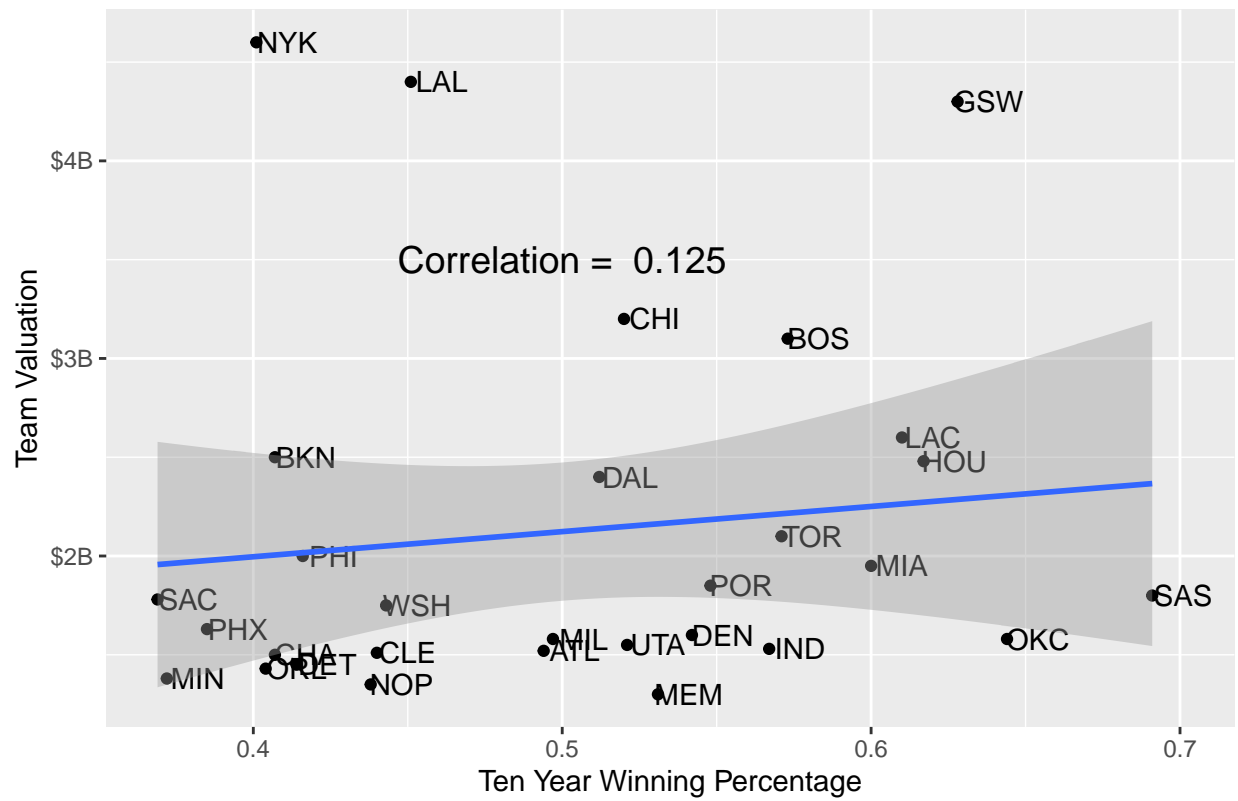Figure 3: Team Valuation vs. Ten Year Winning Percentage
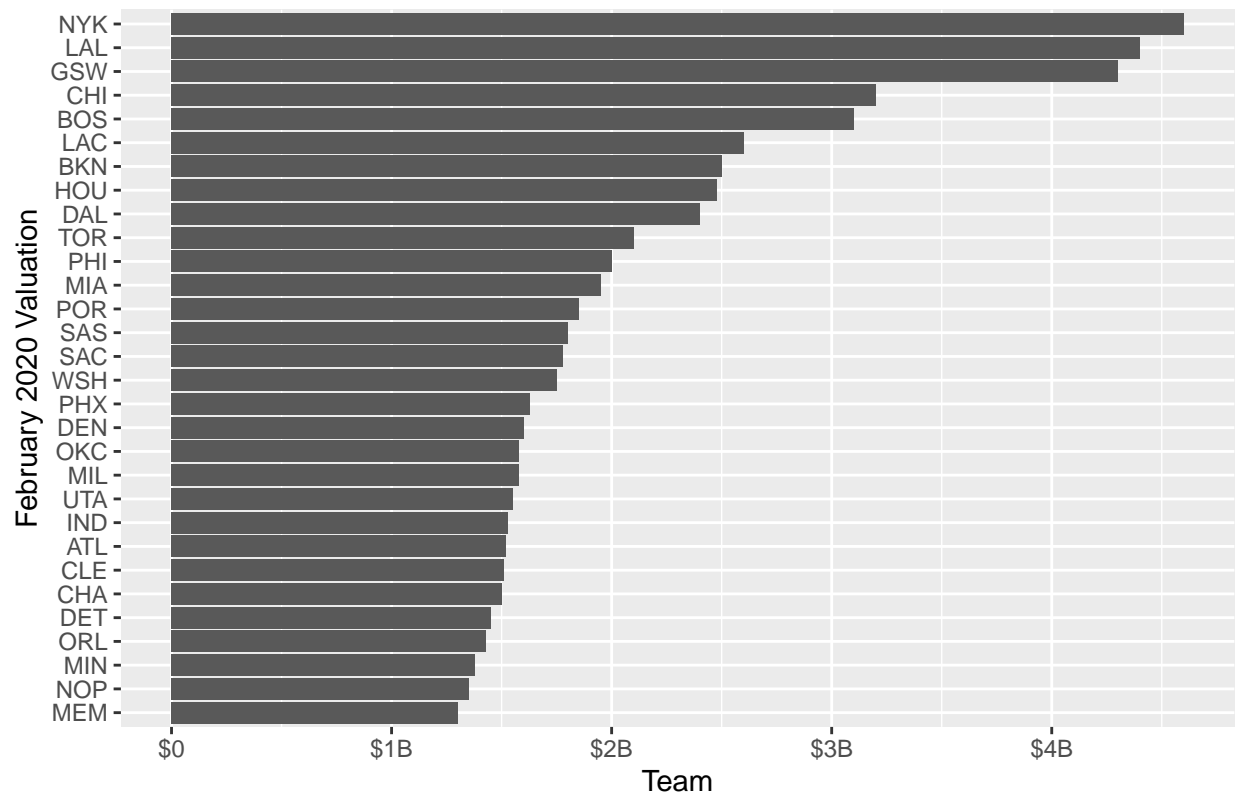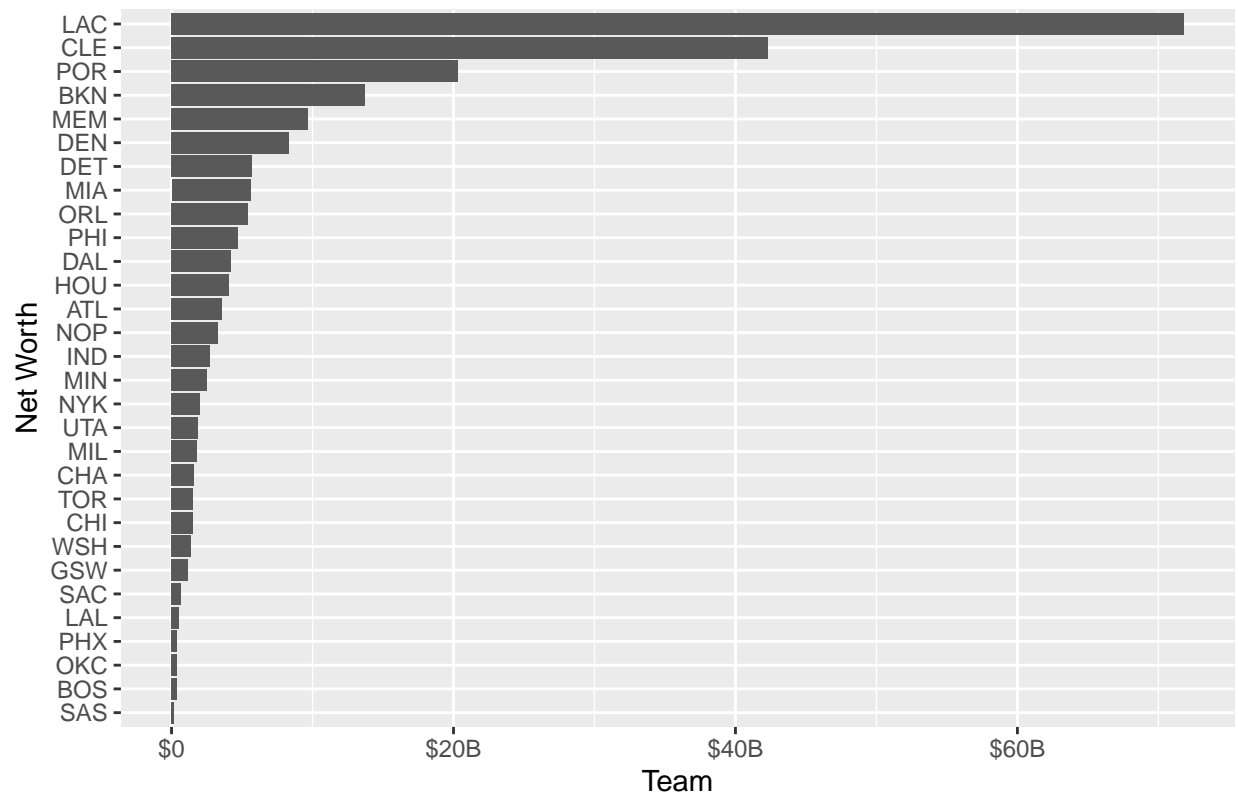
Figure 4: Team Valuations

Figure 5: Team Majority Owner's Net Worth

## Code

```r
knitr::opts_chunk$set(echo = FALSE)
library(tidyverse)
library(ggplot2)
library(gt)

# Reading in the data
nbainfo <- read_csv("nbainfo.csv",
                    col_type = cols(team = col_character(),
                                    "1920winpct" = col_number(),
                                    winpctrank = col_number(),
                                    "1920ortg" = col_number(),
                                    ortgrank = col_number(),
                                    "1920drtg" = col_number(),
                                     drtgrank = col_number(),
                                    "1920nrtg" = col_number(),
                                     nrtgrank = col_number(),
                                    "1920pace" = col_number(),
                                     pacerank = col_number(),
                                    gtcontracts = col_number(),
                                    po_ngs = col_number(),
                                    avgage = col_number(),
                                    medage = col_number(),
                                    avgexp = col_number(),
                                    medexp = col_number(),
                                    "2021projsalary" = col_number(),
                                    "2021projcapspace" = col_number(),
                                    "2021projexceptions" = col_character(),
                                    tenyrwin = col_number(),
                                    tenyrloss = col_number(),
                                    tenyrwinpct = col_number(),
                                    winpctrank_10 = col_number(),
                                    playoffpct = col_number(),
                                    principal_owner = col_character(),
                                    nw = col_number(),
                                    owned_since = col_number(),
                                    business = col_character(),
                                    other_owners = col_character(),
                                    valuation = col_number(),
                                    percent_change = col_number(),
                                    debt_to_value = col_number(),
                                    revenue = col_number(),
                                    operating_income = col_number())) %>%
  rename_with(~ str_replace(.x, "1920", "current")) %>%
  rename_with(~ str_replace(.x, "2021", "future")) %>%
  slice(1:30) %>%
  subset(select = -futureprojcapspace)

playercontracts <- read_csv("bbrefcontractdata.csv", col_type = cols(
  playername = col_character(),
  playerid = col_character(),
  team = col_character(),
```

```r
    salary1920 = col_double(),
    salary2021 = col_double(),
    salary2122 = col_double(),
    salary2223 = col_double(),
    salary2324 = col_double(),
    salary2425 = col_double(),
    signedusing = col_character(),
    guaranteed = col_double()
))

playercontracts_modified <- playercontracts %>%
  filter(salary2021 >= 20000000) %>%
  arrange(desc(salary2021))

tibble(subject = c("2019-2020 Season",
                   "Projection for Next Season With No Fans"),
       ynear = c("$8B", "$4.8B"),
       yfar = c("$4B", "$2.4B"),
       ydiff = c("$4B", "$2.4B")) %>%

    # table setup
    gt() %>%
    cols_label(subject = "BRI",
               ynear = "Total",
               yfar = "Players",
               ydiff = "Owners") %>%
    tab_style(cell_borders(sides = "right"),
              location = cells_body(columns = vars(subject))) %>%
    tab_style(cell_text(weight = "bold"),
              location = cells_body(columns = vars(subject))) %>%
    cols_align(align = "center", columns = TRUE) %>%
    fmt_markdown(columns = TRUE) %>%
    tab_header(title = "Figure 1: Potential BRI Drop in 2020-2021 Season",
               subtitle = "Commisssioner Adam Silver projects ticket sales
               comprise 40% of BRI")
# Some cool graphs

nbainfo %>%
ggplot(aes(x = currentwinpct, y = valuation, label = team)) +
  geom_point() +
  stat_smooth(formula = y ~ x, method = "lm", se = TRUE) +
  geom_text(nudge_x = 0.02) +
  annotate(x=0.5, y=3.5, label=paste("Correlation = ",
                                     round(cor(nbainfo$currentwinpct,
                                               nbainfo$valuation), 3)),
           geom="text", size=5) +
  labs(title = "Figure 2: Team Valuation vs. 2019-2020 Winning Percentage",
       x = "2019-2020 Winning Percentage", y = "Team Valuation") +
  scale_y_continuous(breaks = c(0, 1, 2, 3, 4),
                     labels = c("$0", "$1B", "$2B", "$3B", "$4B"))

nbainfo %>%
ggplot(aes(x = tenyrwinpct, y = valuation, label = team)) +
```

```
  geom_point() +
  geom_text(nudge_x = 0.01) +
  stat_smooth(formula = y ~ x, method = "lm", se = TRUE) +
  annotate(x=0.5, y=3.5, label=paste("Correlation = ",
                                      round(cor(nbainfo$tenyrwinpct,
                                                nbainfo$valuation), 3)),
           geom="text", size=5) +
  labs(title = "Figure 3: Team Valuation vs. Ten Year Winning Percentage",
       x = "Ten Year Winning Percentage", y = "Team Valuation") +
  scale_y_continuous(breaks = c(0, 1, 2, 3, 4),
                     labels = c("$0", "$1B", "$2B", "$3B", "$4B"))

nbainfo %>%
  ggplot(aes(x = fct_reorder(team, valuation), y = valuation)) +
    geom_col() +
    coord_flip() +
    labs(title = "Figure 4: Team Valuations", x = "February 2020 Valuation",
         y = "Team") +
    scale_y_continuous(breaks = c(0, 1, 2, 3, 4),
                       labels = c("$0", "$1B", "$2B", "$3B", "$4B"))

nbainfo %>%
  ggplot(aes(x = fct_reorder(team, nw), y = nw)) +
    geom_col() +
    coord_flip() +
    labs(title = "Figure 5: Team Majority Owner's Net Worth", x = "Net Worth",
         y = "Team") +
    scale_y_continuous(breaks = c(0, 20, 40, 60, 80),
                       labels = c("$0", "$20B", "$40B", "$60B", "$80B"))
```