## Regression Equation

As mentioned in section 3.3, we deem a combination of exploratory factor analysis and regression analysis as most suitable method for analysis of our dataset. We apply the Latent Moderated structural equations model to our framework to obtain the best estimates of coefficients. Including factor scores into a linear regression can introduce bias(..),. Therefore, we decided to pursue a structured equation modeling approach. For our Latent moderated equation we estimate the following regression equations.

**Equation 1:** home\_performance(outcome): β0 + β1COVID-19+ β2SPI + β3foreigners\_used\*COVID-19 + β4team\_age\*COVID-19 + β5 SPI\*COVID-19 + β6prob β7league\_fixed\_effects

Where home\_performance is a factor score comprising of several direct metrics of match outcome including goals and points. Our covid variable captures whether or not a game was played behind closed doors or not.

**Equation 2:** home\_performance(pure performance): β0 + β1COVID-19+ β2SPI + β3foreigners\_used\*COVID-19 + β4team\_age\*COVID-19 + β5 SPI\*COVID-19 + β6prob + β7league\_fixed\_effects

**Equation 3:** referee\_bias: β0 + β1COVID-19 + β2SPI + β3COVID-19 \* Occupancy + β4league\_fixed\_effects + β5

The next step in our analysis is to

**Equation 4:** home\_performance(outcome): β0 + β1referee\_bias + β2SPI + prob + β7league\_fixed\_effects

**Equation 5:** home\_performance(pure performance): β0 + β1COVID-19+ β2SPI + β3foreigners\_used\*COVID-19 + β4team\_age\*COVID-19 + β5 SPI\*COVID-19 + β6prob + β7league\_fixed\_effects