

The Dynamics of Racial Discrimination in a Virtual Labour Market

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What do we know?



1- Observation studies: several biases....

Natural experiments (Giuliano et al. , 2009) - Manager hire candidate from own race

2- Experimental evidence

Workers lower wages by 8% to work with same ethnicity (Hedegaard and Tyran, 2018)

3- Correspondence studies:

Bertrand and Mullainathan (2004): Whites receive **50%** more call back

Di Stasio and Heath (2019): UK – no change in discrimination call back in 50 years!!!

but correspondence studies measure only an intermediate step not the outcome of interest (i.e. hire, wages).

does not explain why employers discriminate?

Still limited evidence on:

- Why employers discriminate?
- Hiring and firing decisions
- Evolution over time
- Cost to the firm
- Effect of competition



Employer/employee database where:

- Discrimination is not unlawful
- Productivity is observed perfectly, and for all potential workers
- No interactions between workers (i.e. no productivity spillover)
- No customers
- Wages are set exogeneously, no monopsony power
- Workers cannot sort themselves

=> **Only source of discrimination: taste for discrimination** (Becker 1957)

Moreover we observe

- Hiring, firing and promotion decisions
- Observed for 38 periods
- Some measures of the competition and discriminatory norms faced by the firms

What is Fantasy Premier league?



On line game (free to participate) - 3.5m participants around the world

- Participants are virtual club/firm owners - £100m budget
- Firms produce points – based on real world footballers' performance
- The firm has a single objective: maximising the number of points produced
- Buy/sell 15 professional footballers among total pool in Premier League
- Hiring/firing decisions made on a weekly basis

Go to

Advantages of the FPL

- Perfect information on all footballers' productivity (no statistical discrimination)
- Perfect information on all footballers' race (Photo)
- Prices of footballers are exogenous to the participant
- No restrictions on the number of participants owning a given footballer (no strategic hiring)
- Overall productivity is purely additive (no workers' interactions)

<http://fantasy.premierleague.com>

Disadvantages of FPL?



Stakes are low

as in a lab experiment

Non financial stakes may be higher

Psychological stakes (bragging) might be high

No physical interaction between employers and employee

- Amigdala activity is detected when pictures of out-group members are presented (Hart et al, 2000) and correlates with implicit evaluation of racial groups and unconscious racial bias (Phelps et al, 2000)

- Discrimination in on-line market (Guryan & Charles, 2013)

Are FF participants similar to employers?

Magnus

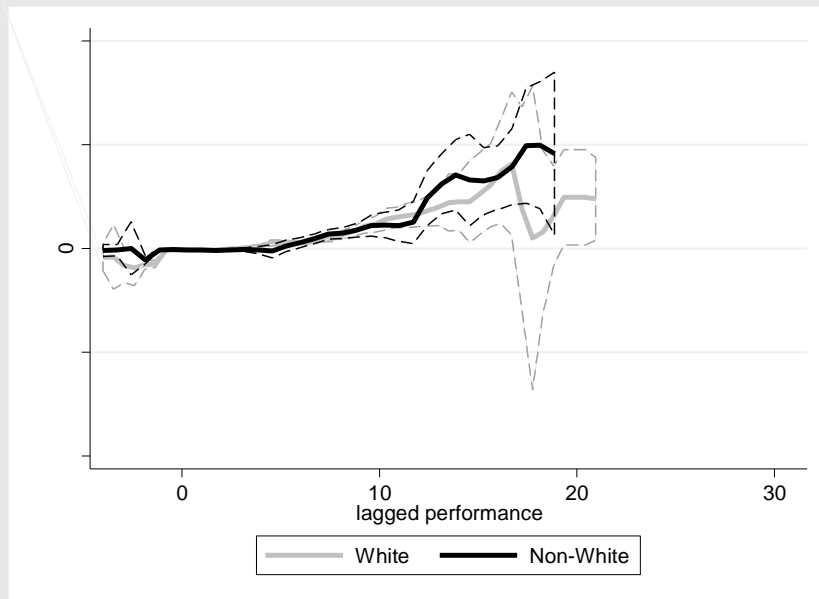
Maybe not in terms of characteristics – but broad population

We have some info on race, gender, previous experience, competition

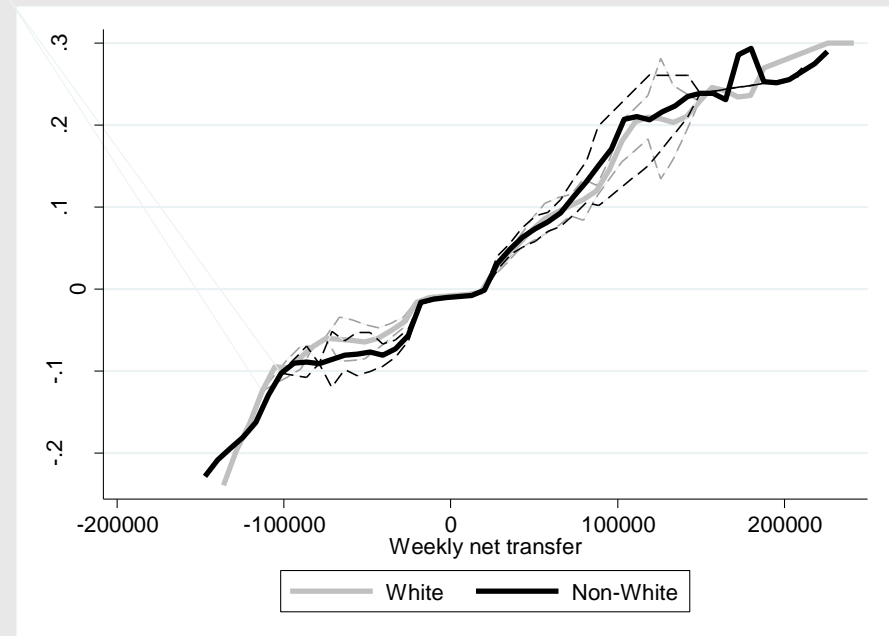
Does FF operate like a labour market?



Lagged performance and net demand



Weekly price change and net demand



FF functions like a labour market

Demand increases with (past) productivity

Price increases with demand

No significant racial differences in its functioning



~3.0m FPL participants

Weekly team selection, including bench, captain.

Team Productivity

History of play in FPL (experience)

Local league participation (Competition/interest)

Country of origin, race, gender (for a subsample only)

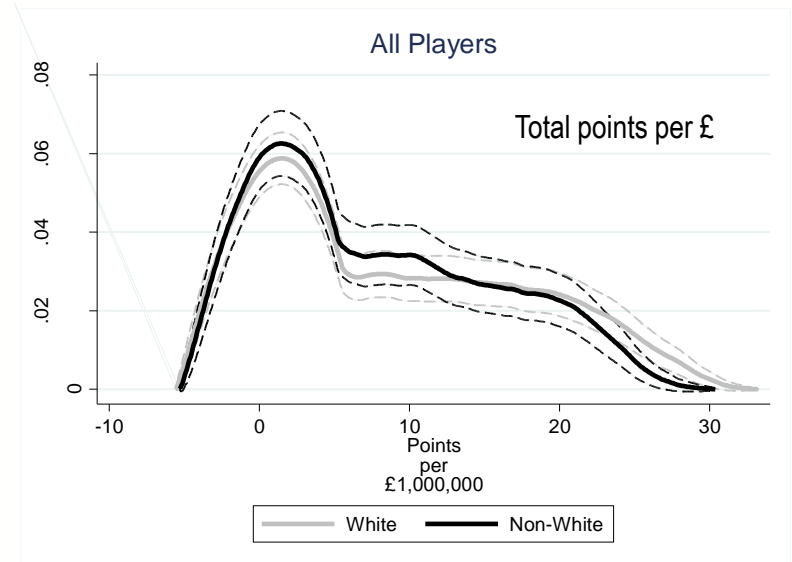
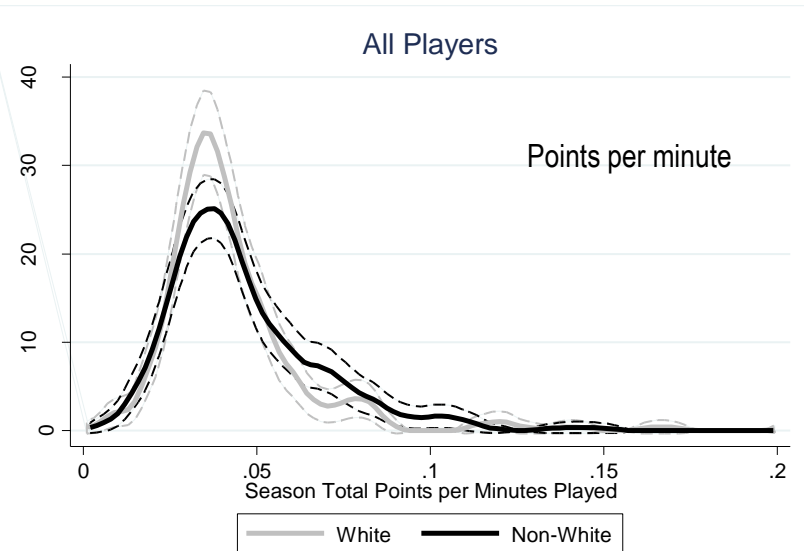
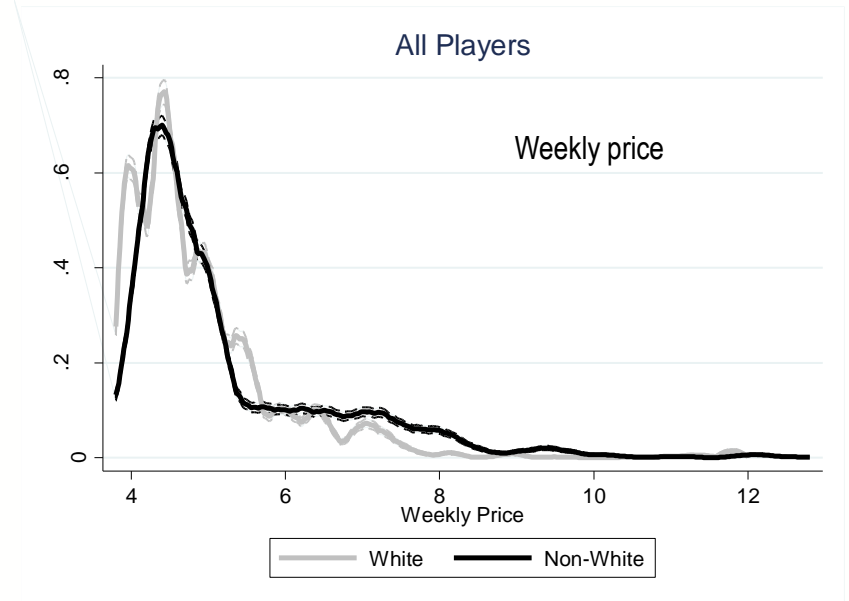
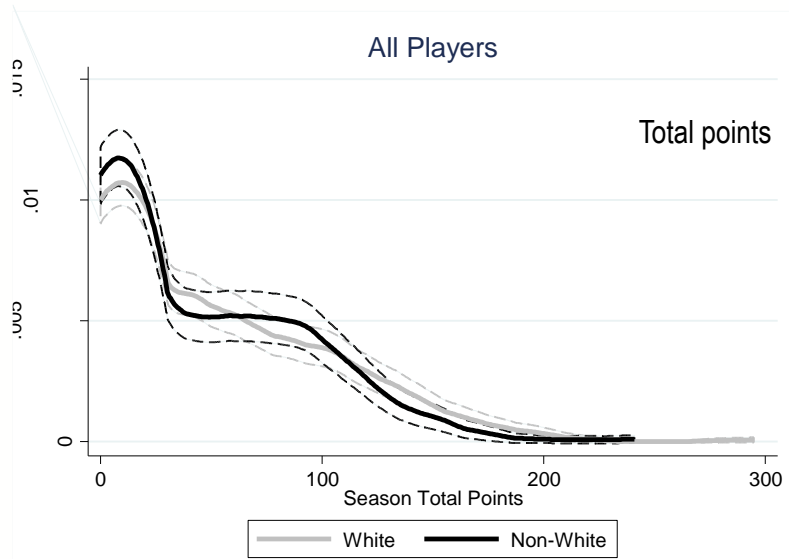
670 professional footballers

Weekly productivity (in FPL): Current and Past

Age, nationality, international status (not from FPL)

Race (Anthropomorphic, name based, skin tone)

Players' substitutability (AI race)



10 Observations with points per minutes greater than 0.2 have been dropped

No significant difference in productivity by race
Also true, by race definition, by player's position in the field

Modelling Initial decision



Matching of player(p) to participants (f)

Create all dyads of p (547) (only footballers available in week 1)
and (named) participants (98,358); \Rightarrow obs = 53,801,826

$$M_{pf} = \alpha \text{ black} * X_p + \beta X_p + \varepsilon_{pf}$$

X_p includes:

Controls: Position, club, experience in PL, International

Performance measures: In PL previous season, Normalised points: previous season
Value

Cluster at Participant level

Separately by

Race definition

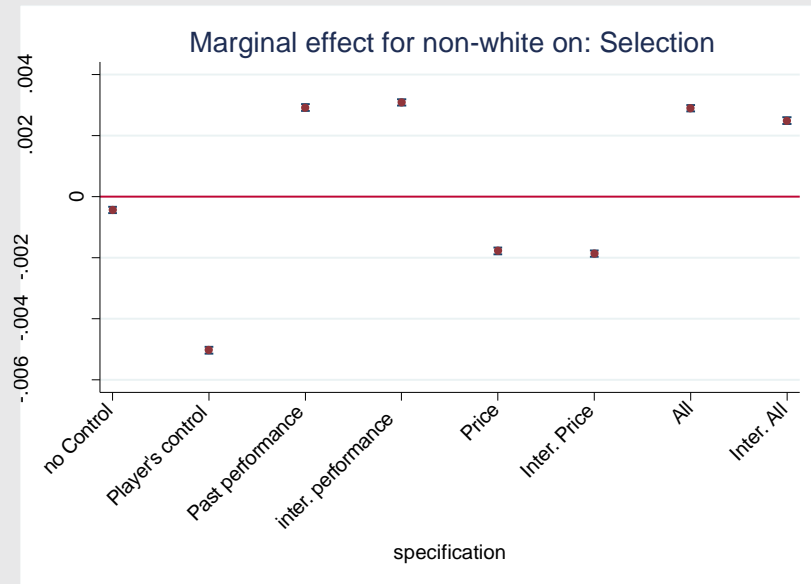
Player's characteristics

Participants' characteristics

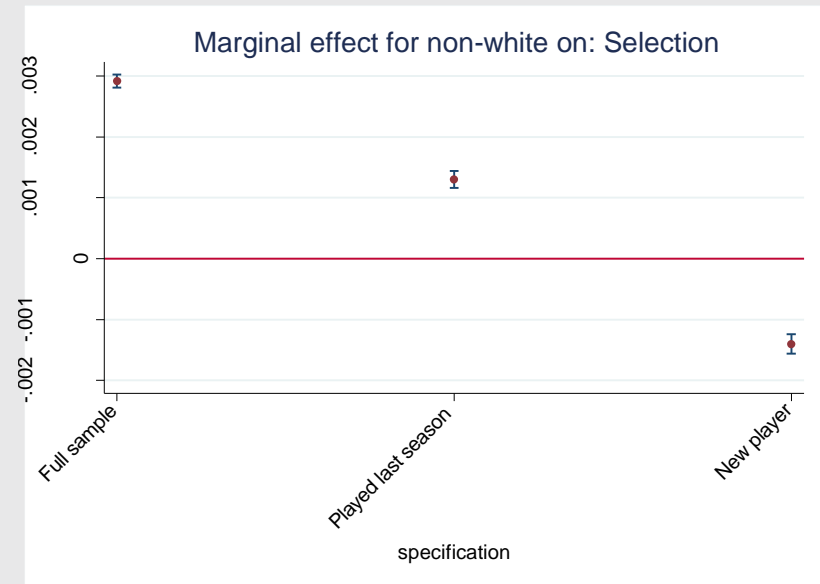
Initial Selection Decision



Full sample



By previous participation status



Evidence of discrimination [$\sim 15\%$] at the mean (0.022), consistent with the literature
However, this disappears when controlling for past productivity

Note, past performance is measured only if played in PL previous season, for others we only have an indicator of being new to PL and no info on past productivity.

Non-white new-comers are discriminated
→ Consistent with statistical discrimination

Other initial decisions – Marginal Players

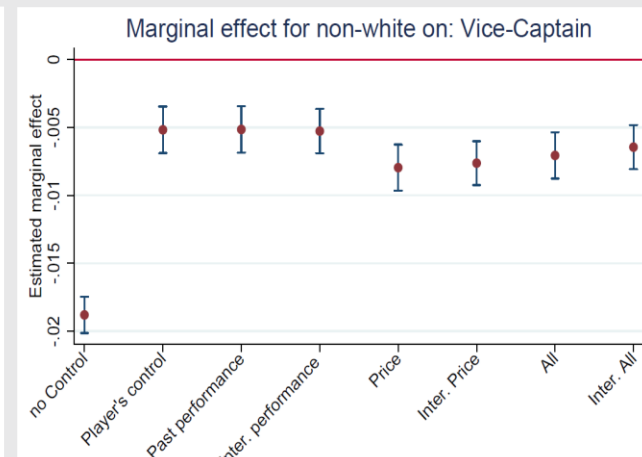
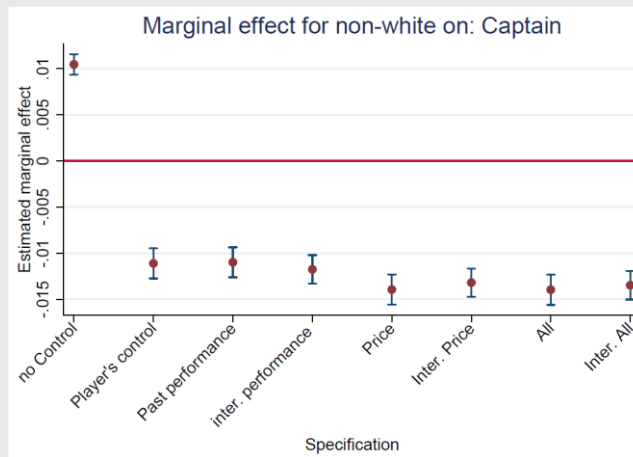
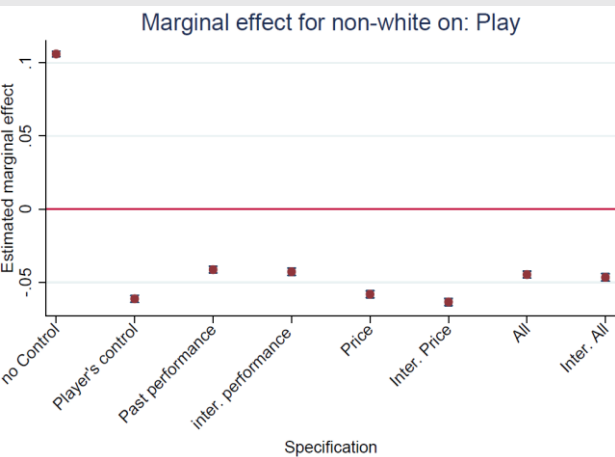


Other decisions in week1 involve marginal players:

Playing: Only 11 out of the 15 squad members have point-accruing status

Captain: Productivity is doubled – This should be the perceived best player

Vice Captain: back up, in case Captain does not play - – This should be the perceived 2nd best player



In all these dimensions, non-whites are discriminated!!!

Modelling Weekly Decisions



Matching of player(p) to firm (f) at period (t) : $p=670$ (458), $f=500$, $t=38$

500 randomly selected among those active until week 35!

Static model

$$M_{pft} = \beta X_{pt} * black + \theta_t + \theta_{pf} + \varepsilon_{pft}$$

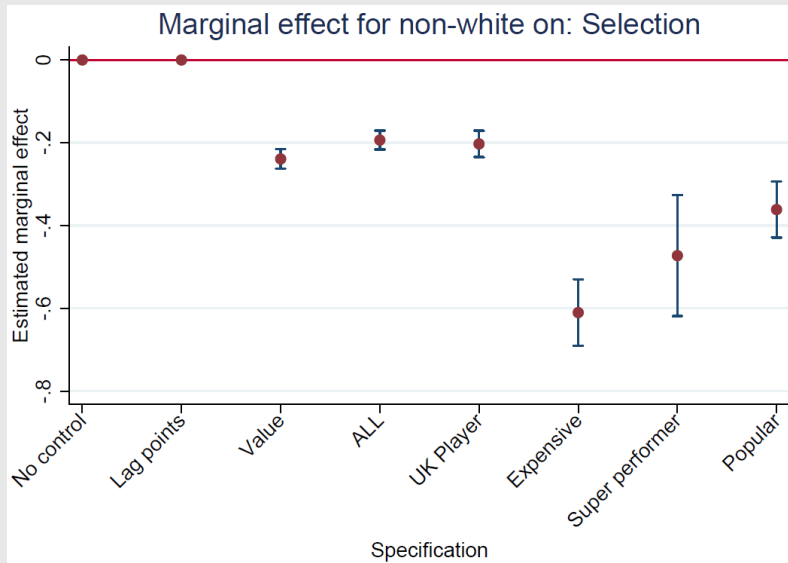
Dynamic model

$$M_{pft} = \alpha M_{pft-1} * black + \beta X_{pt} + \theta_t + \theta_{pf} + \varepsilon_{pft}$$

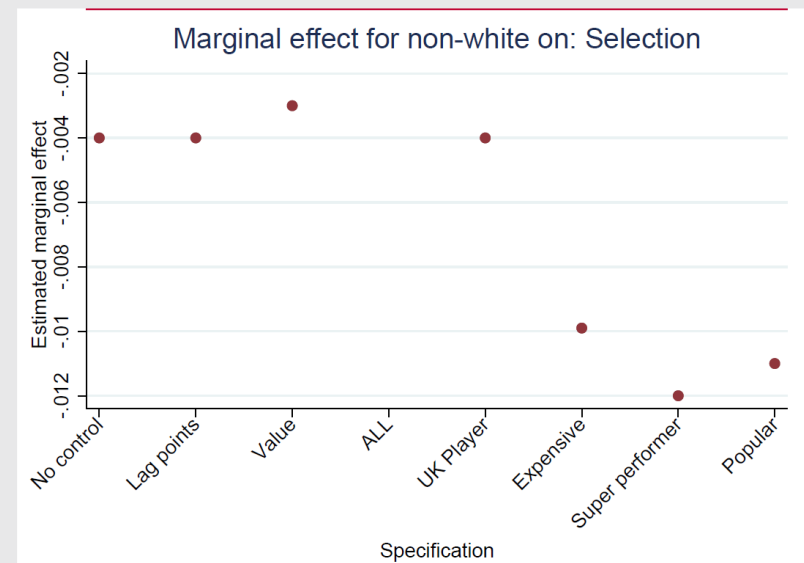
Matching over the season – Persistent Managers



Static model



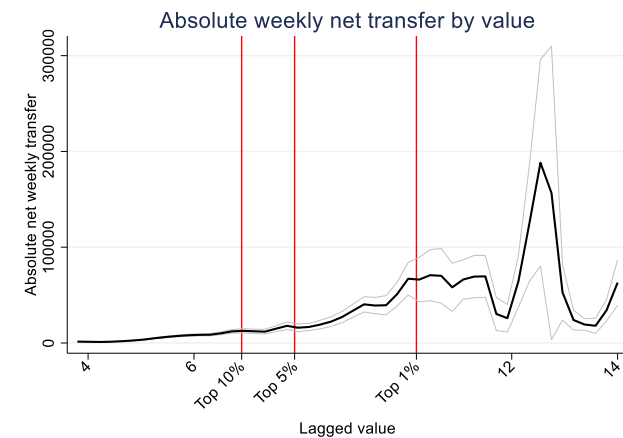
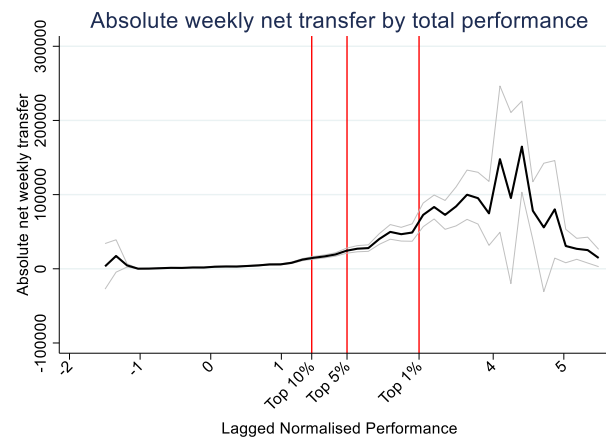
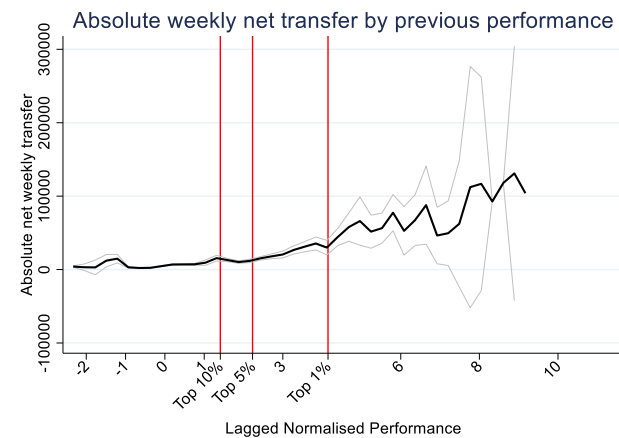
Dynamic model



Conditional on value – black players are less likely to be selected,
- especially if they are stars!!!

Black players are also less likely to be retained (mean for white = 95%) in team,
especially if stars.

More attention is paid to star performer



Transfer activities is concentrated on the top 5% performer.

Transfers activities of Top 5% is at least 2.5 greater than non-top 10%

Transfers activities of Top 1% are at least 4 times greater

But no difference by race

Total Productivity Loss

Loss = (points - maximum achievable) / (maximum achievable) *100

Average efficiency 37%

Discriminator gain 0.5 to 1 percentage points of efficiency per week!!!

Discriminator type	Full sample			Persistent Managers		
	Base	Manager controls	Manager Fixed Effects	Manager Fixed Effects	Manager Fixed Effects	Manager Fixed Effects
Discriminator Indicator	-0.966*** [0.005]	-0.965*** [0.024]	-0.311*** [0.003]	-0.873*** [0.004]	-0.339*** [0.004]	-0.522*** [0.004]
Never played before	0.961*** [0.011]	0.953*** [0.053]				
Nbr of past Participation	0.318*** [0.003]	0.319*** [0.012]				
Top 5% achiever	-6.425*** [0.020]	-6.500*** [0.092]				
Top 25% achiever	-4.829*** [0.014]	-4.913*** [0.065]				
Top 75% achiever	-2.619*** [0.011]	-2.731*** [0.051]				
Participate in at least 1 local league	-2.340*** [0.010]	-2.539*** [0.047]				
Nb of local league	-0.493*** [0.002]	-0.455*** [0.009]				

Conclusion



In a world where wages are fixed exogenously, discrimination operates through:

- bias in perceived productivity (even if observed!!)
- taste for discrimination

- Discrimination in hiring, especially for new players
- Discrimination on the most productive players: Point-paying position or captain.
- Discrimination in firing; i.e. teams become whiter over-time (inconsistent with learning)
- Especially for superstars!!!!

=> Consistent with more attention being paid to star performer and as in Becker, non-white needing to be more productive to overcome taste for discrimination

Due to high substitutability, discrimination increases productivity!!!