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EVIDENCE FROM EUROPEAN FOOTBALL CLUBS

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Does Employing Skilled Immigrants Enhance Competitive Performance? Evidence from European Football Clubs

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ABSTRACT

We investigate the effect of hiring skilled immigrant employees on the performance of organizations. This relationship has been difficult to establish in prior work due to theoretical ambiguity, limited data, and inherent endogeneity. We overcome these difficulties by studying European football (soccer) clubs during 1990-2020. Detailed microdata from this setting offers unusual transparency on the migration and hiring of talent and their contribution to collective performance. Further, the industry is characterized by country-level rule changes that govern the number of immigrant players clubs can hire. Using these rule changes as the basis for instrumental variables, we find a positive local average treatment effect of the number of immigrant players on the club's in-game performance. To examine the theoretical mechanisms, we explore whether immigrants cause superior performance because they are more talented than natives or because they enhance the national diversity of their clubs. We find strong evidence for the talent mechanism. We find contingent evidence for the national diversity mechanism: national diversity has a positive relationship with club performance only when the club employs an immigrant manager (coach). The presence of an immigrant manager also strengthens the positive relationship between the number of immigrant players and club performance.

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1. Introduction

This paper examines whether organizations that employ more skilled immigrants outperform their rivals. Immigration is a topic of vital interest to managers around the world, and yet classic studies of immigration typically abstract away from organizations, focusing instead on macroeconomic issues including how immigrants shape labor markets, productivity, growth, and innovation at the national or subnational level (see Peri (2016) for a recent review). Kerr, Kerr, and Lincoln noted that “there is very little tradition for considering firms in analyses of immigration” (2015, p. S148). Since then, a small but rapidly growing literature has shown that immigrants have meaningful effects on critical organizational phenomena such as employment structure (Doran et al. 2014, Kerr et al. 2015), investment choices (Burchardi et al. 2019, Glennon 2020, Hernandez 2014), and innovation (Choudhury and Kim 2019, Foley and Kerr 2013).

Despite these advances, we have little systematic evidence of whether and why hiring skilled immigrants improves an organization’s overall competitive performance. For example, Beerli et al. (2021, p. 977) recently stated that “our knowledge on how immigration policies affect firms’ success ... is limited.” Shedding light on this fundamental question is urgent. Organizations in many parts of the world find that the cost and effort required to employ skilled immigrants is increasing, in part because of heightened debate in social and political circles regarding the economic merits of immigration. For example, managers find themselves navigating increasingly complex and unpredictable immigration regulations and engaging with political figures in increasingly fraught debates about immigration (e.g. Wiener-Bronner 2018). Managers need to understand, now more than ever, the competitive payoffs of these costs. We seek to make progress on this issue by examining whether and why skilled immigrant employees improve their performance of their organizations.

While it seems that some managers believe that skilled immigrant employees increase the performance of their organizations (otherwise we would be less likely to observe them advocating publicly for the liberalization of immigration rules), it is theoretically unclear whether organizations that

employ skilled immigrants will—on average—outperform their rivals. On the one hand, immigrants might help firms outperform rivals if immigrants are more talented than natives or if they bring unique skills to the organization that complement those of natives. On the other hand, immigrants might have a null—or even negative—impact on performance. Skilled immigrants might lag behind natives in terms of skills and social capital, or immigrants and natives might have difficulty cooperating with each other. Given the absence of clear theoretical guidance, we adopt an abductive, data-driven approach. We inform our inquiry with broad insights from related work and then we rely on a series of empirical tests to help us spell out mechanisms that might explain any positive or negative relationship between hiring immigrants and organizational performance.

We study a context that is unusually well-suited to studying the causal effect that employing skilled immigrants has on the performance of organizations: European football (soccer) clubs during 1990-2020. Several features of European football make provide us with unusual advantages for studying the causal effect that employing highly skilled immigrants has on organizational performance. First, this economically significant setting bears many similarities with other industries that feature skilled human capital-intensive production and head-to-head competition, such as litigation, sales, and research and development. Second, the granularity of the data allows us to explore underlying mechanisms and boundary conditions in ways that are simply impossible with other data sources. Finally, and most importantly, European football clubs employ players from around the world, and changes in foreign player hiring policies by different national leagues create exogenous variation that helps us overcome the endogeneity of the relationship between the employment of skilled immigrants and the performance of the organization¹.

Using an instrumental variables approach rooted in the international trade literature (Feyrer 2019), we find a positive relationship between the number of immigrant employees and organizational

¹ We join scholars who have used football data to address a variety of important organizational research questions that are difficult to address with other data, such as the effect of taxation on labor mobility (Kleven et al. 2013), the effects of career prospects on employee motivation (Miklós-Thal and Ullrich 2016), and the degree to which cognitive biases affect managers' assessment of individual performance (Gauriot and Page 2019).

performance. The results suggest that each additional immigrant player improves a club's margin of victory (i.e. the goal difference) by about 0.12, a meaningful but plausible local average treatment effect that is about 20% of the sample mean.

Guided by existing theory, we then consider two mechanisms that could explain this relationship. First, skilled immigrants might possess more ability than natives. Given the frictions involved in moving across borders and in the process of hiring foreigners, skilled immigrants might be drawn from the right-tail of the talent distribution (Borjas 1987)—similar to the way that sex discrimination creates barriers for all but the most talented women in male-dominated professions like medicine (Tsugawa et al. 2017) or securities analysis (Kumar 2010). We find evidence consistent with this mechanism by examining a series of individual measures of performance such as pass accuracy, propensity to be in the starting lineup, and goals. Along all measures, we find that immigrant players outperform natives, even when accounting for a large set of observables (e.g. the player's market value and club*season*position fixed effects).

Second, immigrants might enhance the national diversity of the organization, which, in turn, might improve collective performance. On the positive side, research suggests that diversity can enhance group performance by enabling creativity and innovation (e.g. Van Knippenberg and Schippers 2007, Maznevski 1994, McLeod et al. 1996). On the negative side, studies also show that diversity can increase interpersonal conflict, which hampers group performance (e.g. Page 2010, Pelled 1996). Yet there is little ex-ante guidance as to how national diversity might impact competitive performance. Contrary to the positive impact of skilled immigrants on scientific innovation documented in prior work (Choudhury and Kim 2019, Hunt and Gauthier-Loiselle 2010), we find that the enhanced national diversity created by hiring immigrants has a null or negative average relationship with competitive performance in our context, depending on the measure of diversity we employ. We consider differences between our context and scientific innovation that could explain these results in the discussion section.

Given that managers likely play an active role in attracting, selecting, and deploying the talent and diversity of employees, we probe further into the mechanisms and boundary conditions by assessing whether having an immigrant manager (i.e. coach) at the football club moderates the main effects

described so far. We find that the number of immigrant players has a stronger positive relationship with club performance when the club has an immigrant manager.² Interestingly, this result does not seem to be driven by immigrant managers being better, on average, than native managers—immigrant managers are associated with better competitive performance only when the club has a high number of immigrant players. Further, we do not find much evidence that immigrant managers attract more talented immigrant players. But we do find that national diversity created by immigrant players from different countries is associated with better club performance when the club has an immigrant manager. Since clubs without immigrant managers experience a *negative* association between diversity and performance, we speculate that immigrant managers are critical in activating the potential benefits of national diversity.

Our study makes important contributions to the literatures on immigration, employee mobility, and competition between organizations. First, we assemble detailed, multinational data—including hand-collected exogenous national-level rule changes—that allow us to measure the effect of immigrant employees on organizational performance. These data allow us to provide one of the first credible tests of the causal relationship between skilled immigrant employees and organizational performance. Second, our abductive investigation provides insights into the mechanisms at play, which can guide future researchers assessing the link between skilled immigrant employees and organizational performance. We call attention to a talent channel and a diversity channel; which one matters more will probably vary across contexts. Finally, we emphasize the role of immigrant managers in enhancing and perhaps even activating the diversity mechanism. More work is needed to confirm our abductive conclusions and place appropriate boundary conditions on them. We hope that this paper is merely a first step towards a more complete understanding of the link between hiring immigrant employees and the competitive performance of organizations.

² We do not explore the match in nationality between the immigrant managers and players, due to sample size issues. Out of over 1 million player-manager interactions, less than 2% involve players and managers of the same nationality.

2. Background

Few topics elicit as strong a reaction as immigration. Amidst the hotly contested issues involved, a central question is whether the cross-national movement of talent has positive or negative economic effects. One major focus of that work focuses on how immigrants affect the jobs and wages of natives (Borjas 1986, Card 2016, Peri 2016), with the preponderance of evidence suggesting that high-skill immigration positively affects both while low-skill immigration has a neutral impact on wages and a positive impact on jobs (National Academies of Sciences, Engineering, and Medicine, 2017). A more recent branch of studies explores the impact of immigrants on innovation, demonstrating that foreign inventors play a disproportionate role in fostering inventions and that they enhance the inventive capacity of natives (e.g. Choudhury and Kim 2019, Doran and Yoon 2020, Hunt and Gauthier-Loiselle 2010, Moser et al. 2014, Moser and San 2020). Yet other stream considers how immigrant populations facilitate trade and capital flows across borders in the form of exports and FDI (e.g. Bandelj 2002, Buch et al. 2006, Combes et al. 2005, Gould 1994). Altogether, this work has provided evidence suggesting that immigration has a net positive effect on economic growth.

But until recently, there has been an important omission from research linking immigration to economic issues: the role of organizations. Kerr, Kerr, and Lincoln (2015) note that a famous review of the literature did not include the word “firm” even once. Ultimately, firms are the primary entity that shape immigrants’ effect on economic outcomes: they hire immigrant workers, they fund most of the inventions in which immigrants participate, and they make most of the capital investments that immigrants facilitate. This deficiency is rapidly being addressed by a growing body of work. For instance, Kerr et al. (2015) show how hiring skilled immigrants modifies the age structure of firm’s STEM workforces. The strategic location choices of multinational firms are influenced by the presence of co-national immigrants abroad (Hernandez 2014, Li et al. 2019) and by restrictions on skilled immigration at home (Glennon 2020). Educated immigrants also affect the types of innovations produced by organizations (Choudhury and Kim 2019), and return migration affects the adoption of novel business

practices (Wang 2015). This work demonstrates how immigrants deeply influence firm strategy, innovation, and investment.

We add to this growing body of work by addressing three central but imperfectly addressed questions: Does hiring skilled immigrant workers improve organizations' average competitive performance? If so, what mechanisms might explain the relationship? Finally, what sources of organizational heterogeneity might exacerbate any positive or negative average relationship between immigrant employees and average organizational performance?

Virtually all research linking migration to economic effects, whether at the macro or firm level, implicitly or explicitly assumes that an organization benefits by hiring immigrant workers. Much of the work assumes that firms hire immigrants because they bring above average abilities or skills (e.g. Borjas 1986). Other work argues that immigrants have experiences and network connections that differ from natives, thus helping link the firm to new sources of ideas, demand, or other resources (Hernandez and Kulchina 2020, Wang 2015). Some studies also argue that valuable complementarities arise from the interactions of immigrant and native workers, helping the firm be more innovative (Choudhury and Kim 2019, Doran and Yoon 2020, Moser et al. 2014, Moser and San 2020).

However, there are good reasons to believe that hiring immigrants might have a null, or even negative, causal effect on performance. Doran, Gelber, and Isen (2014) examine how adding an additional H1-B worker by winning a visa lottery impacts the innovation, employment, and profits of firms. They find a mixture of null effects and modest positive effects, and conclude that endogenous matching between immigrants and high-quality firms drives some of the positive outcomes discussed in previous studies. The group dynamics literature even suggests that hiring immigrants might *hurt* organizational performance. While diversity can create novelty and creativity, it can also spur dissent and lack of cooperation in groups (e.g. Page 2010). If immigrants and natives cannot successfully cooperate, hiring immigrants might hurt organizational performance.

The little empirical evidence addressing the immigration-performance link directly does not resolve the theoretical ambiguity underlying the relationship between immigration and organizational

performance. Beerli, Ruffner, Siegenthaler and Peri (2021) document that firms benefited from a Swiss reform that made it easier to hire migrants. Doran, Gelber, and Isen (2014) examine how winning an H1-B visa lottery impacts the innovation, employment, and profits of firms. And Mitaritonna, Orefice and Peri (2017) find that French firms grow more quickly when their neighborhood contains more immigrants. But these authors lack employer-employee linked data, so they are unable to discern which firms actually employ immigrants. The absence of microdata also makes it difficult to explore the mechanisms that link employment of immigrants to the performance of the firm. And they abstract away from organizational heterogeneity, which seems likely to affect whether or not firms might benefit from hiring immigrants. Consequently, there is much we still need to understand about the relationship between hiring immigrants and strategic performance. We thus hope to spark a deeper engagement between the immigration and organizational literatures.

Given the foregoing considerations, our motivation is twofold. First, we empirically examine whether hiring immigrant workers has any effect, positive or negative, on organizations' competitive performance. Second, depending on what we find, we seek to explore what mechanisms explain the effect. For example, if we find that immigrant employees have a positive effect on organizational performance, we want to understand whether it is driven by immigrants being more talented than natives or by novel combinations of immigrant and native skills. And if we find that immigrant employees have a negative relationship on organizational performance, we want to understand if the effect is driven by mechanisms of dissent or poor cooperation.

Given that there is very little theoretical precedent to help us develop deductive hypotheses to guide our inquiry, we adopt an abductive, data-driven approach to address our questions. We begin by focusing on the main relationship between hiring immigrant workers and organizational performance, with the aim of establishing a causal relationship, whether positive or negative. We then draw from the guidance of the previous studies we summarized in this section to explore potential mechanisms by which immigrant workers might improve or degrade organizational performance. Finally, we explore a critical source of organizational heterogeneity—leadership characteristics—that might create boundary

conditions on the relationship between immigrant employees and performance. In the discussion section, we complete our abductive work by providing a theoretical framework to guide future research.

3. Data and Research Design

3.1 Institutional Context and Research Design

The relationship between hiring immigrants and competitive performance is inherently endogenous. An ideal experiment to test such a relationship would require randomly assigning some organizations to hire immigrants and some not to, and then comparing outcomes across the two groups. Further, if we subsequently wanted to understand the mechanisms underlying those outcome differences, we would need to directly measure the quality of the individual immigrants hired, the composition of all individuals involved in doing the organization's work, and the attributes of different organizations that may create variance in how hiring immigrants affects performance. This is a tall order, and for obvious reasons the ideal experiment is impossible.

However, we have identified a setting in which almost all these features exist: professional football (soccer) in Europe. Football is an economically important industry³ in which talent is the most critical input for success. Because of its near universal appeal and a fairly open labor market, football attracts talent from virtually every country and draws from a broader and more flexible global labor pool than many other industries. Appendix I contains details on how the football labor market works, including the process of hiring and transferring immigrant players, along with some important differences relative to American sports. While every country has a professional league, there is wide agreement that five European leagues compete in a truly global labor market for the world's best players: the English Premier League, the Spanish Liga, the Italian Serie A, the German Bundesliga, and the French Ligue 1. Figure 1 shows that immigrant players from 134 unique countries have played in these five leagues over the past thirty years. Our study focuses on clubs that play for these prestigious leagues.

³ Deloitte, a consulting firm, estimates a market size for the European football leagues of more than 30 billion dollars (Deloitte 2019). In 2020, the top 20 football clubs generated a combined revenue of 10 billion dollars (Deloitte 2020).

*** INSERT FIGURE 1 HERE ***

In addition to its human capital-intensive and global nature, European football has an additional feature that plays to our advantage in addressing the endogeneity underlying our research question: the governing bodies (i.e. football associations) of each of the five leagues have made significant—and different—changes over time to the rules regarding (1) how many foreign players clubs can sign and field, and (2) what nationalities are considered “foreign.” For example, the Spanish Football Association (FA) allowed a maximum of three immigrant players in 1990, then increased the limit to four between 1991-1995, then to six during 1996-1999, then down to five in 2000, down to four between 2001-2003, down to three in 2004, after which it jumped to five in 2005 and has remained at that number since. But who is considered foreign also changed over time. Until 1996, any player born outside of Spain was counted towards the foreigner cap. Then the famous 1996 “Bosman rule” (see Appendix I) made anyone with a passport from the European Union equivalent to a domestic (non-foreign) player. And since 2004, other enlargements to the pool of countries considered non-foreign were made (e.g. Russia added in 2005, Cotonou Agreement countries added in 2008, changes to EU membership in various years). Every league made similar changes over time, but with different caps and definitions of “foreign” at different points in time. These changes are documented in Table 1a and 1b, and a detailed description of the data collection process for documenting them is in Appendix II. We exploit the variation caused by these changes across *countries* and over *time* to identify the effect of hiring more immigrants on organizational performance. Figure 2 illustrates the variation generated by these policy changes; clubs do indeed employ more immigrant players when their respective league’s restrictions are loosened.

*** INSERT TABLE 1a, TABLE 1b, AND FIGURE 2 HERE ***

Our empirical strategy takes advantage of another critical feature of European football: clubs play in both domestic and international tournaments. The domestic tournaments are the five leagues already listed plus a single elimination “cup” tournament in each country (e.g. the FA Cup in England). Because all clubs from the same country are subject to the same caps on immigrant players, there is no variance in the number of foreigners they are allowed to have at their disposal when same-country clubs play each

other. The international tournaments, governed by the Union of European Football Associations (UEFA), pit the best 6-8 clubs from each country against each other and include the Champions League and the lower-tier Europa League. Because clubs from *different* countries are subject to varying caps on immigrant players at any given point in time, we can use the international games as a setting in which exogenous rules differentially constrain each club in the number of immigrant players they can field or sign. This is the crux of our identification strategy, whereby we use variation in the caps on immigrant players across countries and over time to identify the impact of hiring immigrants on organizational performance in these international league competitions. This variation becomes the basis for constructing an instrumental variable, the details of which we provide later.

European football has other virtues as an institutional setting for empirical purposes. The granularity of the available information is remarkable. We can perfectly measure the country of birth of each player, track the career history of every individual as they move across clubs and countries, and measure organizational (club) performance in every game. The competitive nature of the game makes it obvious who is competing with whom, and the observability of talent is such that we can measure individual contributions and link those contributions to collective performance. This will be critical in allowing us to isolate the mechanisms explaining any effect of immigrant players on performance. Further, many otherwise unobservable sources of firm heterogeneity that explain performance differentials in other settings are implicitly controlled for in football because all teams face the same strict rules (e.g., all rosters are of the same size, only a fixed number of players can be fielded).

Of course, the uniqueness of the setting raises questions about the generalizability of any results. We are aware of this issue and will note in the discussion how some of our findings may be peculiar to football (or sports) and not apply to a typical business firm. Still, the benefits we listed suggest that this is a valuable context to explore our questions. And football shares at least some critical features with other settings like sales, R&D, academia, and litigation, in which talent or skill are the most important input, competition is salient, and the contributions of talented individuals play a critical role.

3.2 Data

3.2.1 Football players, matches, and clubs. We collected longitudinal data for every match, player, manager (i.e. coach), and club in the five European leagues mentioned earlier and in the two major European international competitions (i.e. Champions League and Europa League) from the 1990/91 to the 2019/20 season from two primary data sources: Transfermarkt and WhoScored.

Transfermarkt is a leading website that covers football matches from all over the world and contains detailed individual web pages for each match, club, player, and manager; its data have been widely used in previous research (e.g. Gauriot and Page 2019, Scelles et al. 2016). For each of the 62,983 matches (domestic and international) played by the clubs in our sample, we obtained all major events that occurred during the match (e.g. goals, yellow cards, etc.) and the list of players involved in the match (starting lineup and substitutions). For each of the 22,242 players present in the club rosters, we gathered country of birth and details of their professional career. We also collected detailed information for the 1,228 managers (coaches) in charge of the clubs during the last three decades.

WhoScored is a leading website offering granular play-by-play data—such as every ball touch, pass, and position for every player during a match—for each club, player, and match. These data are only available starting in the 2009/10 season, so we only have such fine-grained detail for about a third of the matches in our sample. The granularity of these data is particularly important for testing the mechanisms pertaining to immigrant players' talent.

3.2.2 Country-level data. To estimate the gravity model used in constructing our instrument (full details below), we construct a bilateral panel dataset from 1990-2019, with five destination countries (England, France, Germany, Spain and Italy) and 193 origin countries. The observation level is thus destination country-origin country-year. For each country and year, we collected the following variables: population, GDP per capita, and FIFA ranking from the World Bank and IMF. For each year-dyad pair, we collected the distance between countries, whether countries have shared language or prior colonial ties, and migration flows from CEPII and the UN. Finally, we incorporated dummy variables to indicate whether players from each origin country were considered foreign in a given year according to the destination country's league rules. We created this dummy variable by hand-collecting the regulations for each

season and league. In Appendix II, we provide a detailed explanation of this process in which we reviewed press articles and official rules and contacted several experts.

3.3 Operationalization of Core Concepts

The variable of main interest in our specifications is *immigrant*, as identified by a player's country of birth. Players born in any country other than the country in which they play are classified as immigrants, regardless of their nationality or league rules at that time.

Our primary measure of performance is the *goal difference* after each match, measured as the difference between the number of goals scored by the focal club and the number of goals scored by the opponent. This is a common performance indicator used in empirical research in this context (Hall et al. 2002, Karlis and Ntzoufras 2009). Football is a low scoring game marked by parity among clubs, so matches can end in a win (positive goal difference), a tie (goal difference = 0), or a loss (negative goal difference). We also use a secondary measure in our models: the indicator *win*, coded as 1 if the focal club won the game and 0 otherwise.

We also rely on other variables when exploring which mechanisms might explain the main effect of immigrants on performance, and we provide the details of those other variables at the appropriate time. Tables 1c and 1d provide descriptive statistics for the main variables of interest (Appendix III shows descriptive statistics at the player-match level).

*** INSERT TABLE 1c AND TABLE 1d HERE ***

4. Results

4.1 Does Hiring More Immigrants Have an Effect on Organizational Performance?

We begin with a naïve OLS model that estimates the correlation between immigrants and organizational competitive performance:

$$Y_{gj} = \alpha_{sl} + \beta_1 \text{immigrant}_{gj} + \epsilon_{gj} \quad (1)$$

Here, Y_{gj} is the outcome of game g played by club j (goal difference or win) and immigrant_{gj} is the number of immigrant players in the starting line-up in game g played by club j . The model includes

season (s) by league (l) fixed effects in some variants⁴, and club (j) fixed effects in other variants. The results appear in Table 2, where columns 1-4 are estimated for all matches in all leagues (domestic and international) and columns 5-8 are estimated only for international (UEFA) tournaments. All specifications show the same result: hiring more immigrant players is strongly positively associated with a better goal differential and a higher probability of winning. Specifically, each additional immigrant player is associated with a 0.03-0.1 increase in the goal differential and a 0.7-2.5% increase in the win probability. These are economically meaningful in a sport in which the modal outcome is a tie (zero goal differential) and in which the typical win involves a one goal difference.

*** INSERT TABLE 2 HERE ***

However, these results are subject to the endogeneity concerns expressed earlier. To address these concerns, we use a 2SLS strategy that exploits the country-level changes in the laws governing (1) the number of immigrant players allowed on a club and (2) the countries that are considered “foreign.” The logic of our instrument is as follows. We estimate a standard gravity model used in the international trade literature, to which we add variables capturing the country-specific rule changes, following Feyrer (2019) and Frankel and Romer (1999). The gravity regressions are then used to create time-series predictions of the number of immigrant players from each source country playing yearly in each destination country. These predictions are then summed to generate a panel of predictions of the total number of immigrant players (regardless of origin country) in each league per year that are exogenous to any specific club’s performance. We now explain each step in detail.

We begin by estimating the following gravity model:

$$z_{odt} = \alpha_{od} + \alpha_t + \delta_1 dom_pol_{odt} + \delta_2 maxfield_{dt} + \delta_3 UKvisa1_{dt} + \delta_4 UKvisa2_{dt} + \delta_5 pop_{dt} + \delta_6 pop_{ot} + \delta_7 GDPpercap_{ot} + \delta_8 GDPpercap_{dt} + v_{odt} \quad (2)$$

⁴ For domestic league matches, the League in Season X League FE includes Premier, Serie A, La Liga, Bundesliga, and Ligue 1. For international league matches, the League in Season X League FE includes Europa and Champions.

where z_{odt} is the average number of immigrant players from origin country o playing in destination country d 's football clubs in a year t , and the independent variables include an indicator for whether domestic league policies consider players from country o as “foreign” in destination country d in year t (dom_pol_{odt}), the maximum immigrant players that can be fielded per destination country d 's regulations in year t ($maxfield_{dt}$), two dummy variables for immigration law changes in the UK separate from league-specific changes ($UKvisa_{dt}$), population for each country, GDP per capita for each country, as well as country-dyad (α_{od}) and year (α_t) fixed effects. These regression results are shown in Table 3; the F-statistics show that the gravity model does an excellent job predicting the average number of immigrant players from country o in playing in country d . Each column shows a slightly different measure of z_{odt} based on the percentage of matches an immigrant player must have been in the starting lineup to be counted. The columns also vary across another dimension: in some variants we predict the total number of immigrant players in the country, while in others we predict the average number of immigrant players per club in the country. As we will show below, the ultimate results are similar regardless of the measurement.

*** INSERT TABLE 3 HERE ***

The reason for estimating a full gravity model specification rather than simply using the policy changes as instruments directly is to control for time-invariant factors—such as geographic distance or colonial or language ties—that correlate with migration flows using country-dyad fixed effects. For instance, Spanish (La Liga) clubs tend to attract more players from Latin America. If we used the policy changes as instruments directly, we might bypass the deep determinants of migration flows between Spain and Latin America and generate identification purely through time-series variation. The gravity model minimizes this potential problem.

We then take the predicted values from the estimation and sum them across all origin countries to come up with an “expected” number of immigrant players for each league country-year:

$$Z_{dt} = \sum_o \hat{z}_{odt}$$

Z_{dt} then becomes our instrument. Figure 3 shows that this instrument, the expected number of immigrant players, performs quite well in predicting the actual number of foreigners by country-year.

*** INSERT FIGURE 3 HERE ***

The next step is to use Z_{dt} as the instrument in a 2SLS estimation. The first-stage equation is as follows:

$$immigrant_{gj} = \gamma_{lt} + \theta_1 Z_{dt} + e_{gj} \quad (3)$$

Where $immigrant_{gj}$ is the actual number of immigrant players on club j in the starting lineup of game g .

Finally, we use the predicted value of $immigrant_{gj}$ in the second-stage equation (represented with \sim above it), as follows:

$$Y_{gj} = \gamma_{lt} + \beta_1 \widetilde{immigrant}_{gj} + \epsilon_{ajt}$$

As before, Y_{gj} is the performance of club j in game g (goal difference or win). The logic is that the number of immigrant players predicted by the instrument is exogenous because it is externally imposed by rules that differ across years and countries. The endogenous choice by clubs to hire a certain number of immigrant players is eliminated, and the identifying variation now comes from the marginal number of immigrant players each club is *allowed* to hire in any given year, under league rules that differ across countries and over time. Recall that we estimate the 2SLS models only for games involving clubs from *different* countries, each of which is subject to exogenously different immigrant player caps⁵. The specification thus includes international league X season fixed effects (i.e. either Europa or Champions League), but not club fixed effects as in some variants of the baseline OLS model. This is because the instrument does not vary across clubs from the same home country. It only varies across years and countries. Including club fixed effects leaves us with almost no variation, making it difficult to identify the local average treatment effect.

⁵ We checked the extent to which the immigrant player cap is a league-level response to low performance in the previous seasons. We observe a low correlation between the average performance of the league's clubs in the UEFA (i.e. Europa and Champions) competitions the season prior to a cap change.

Table 4 reports the results of the second stage estimation. Columns 1-4 report the results when the dependent variable is the goal difference, while columns 5-8 report the results when the dependent variable is the win indicator. The various columns differ in how the instrument was constructed, as explained in the table notes, but the results remain qualitatively similar across specifications. Critically, the first stage F-statistic for the excluded instrument is well above 10 in all specifications, indicating that the instrument is not weak.

*** INSERT TABLE 4 HERE ***

Consistent with the reduced-form OLS results, the local average treatment effect of hiring additional immigrant players on goal differential and win probability is positive and significant. The estimates suggest that hiring an additional immigrant player improves a club's performance in any given international match by between 0.12 and 0.20 goals and increases the probability of winning that match by between 2 and 5%.

4.2 Interpretation of Instrumental Variable Regression Results

It is important to explain the interpretation of the results from the instrumental variables (IV) regressions. We want to emphasize two issues. First, the IV regressions recover an estimate of the local average treatment effect (LATE), a quantity with an unusual interpretation (Imbens and Angrist 1994). The LATE is the effect of hiring an additional immigrant worker on club performance for only a subsample of clubs: those clubs which respond to the liberalization of immigrant employee rules by hiring additional immigrant employees. The IV literature calls these clubs “compliers.” There are good theoretical reasons to think that these clubs might be different from other clubs, such as those that do not respond to liberalization by hiring more immigrants (i.e. “never takers”)⁶. Essentially, compliers are the clubs that would like to hire an additional immigrant player, but cannot, given current restrictions. Complier clubs

⁶ Every league in our data imposes at least some restrictions on hiring immigrant players, so our data cannot contain “always takers”, i.e. clubs that would employ more immigrants without rule liberalization. Some clubs traditionally hire players from certain nationalities or regions and may behave as “never takers”, i.e. they would not employ immigrants. One example is Athletic Bilbao, which primarily hires players from the Basque Autonomous Community. We do not see a strong theoretical reason to expect our sample to include “defiers”, i.e. clubs that respond liberalization by hiring *fewer* immigrant players. Thus, our data seem to satisfy the monotonicity assumption required to identify the LATE.

may, for example, have a weaker pool of native workers, such that it is very attractive to hire an additional immigrant worker as soon as it is possible to do so. Or complier clubs might have better immigrant scouting resources than other clubs, because they are able to identify immigrant workers who are more talented than their pool of natives.

Consequently, the LATE quantity that we estimate is likely to be larger than an average treatment effect that might apply to the entire sample, because “complier” clubs which want to hire more immigrants—but cannot without rule liberalization—are likely to get the biggest returns from hiring immigrants. This helps to explain why our 2SLS estimates are larger than our OLS estimates (which include the average treatment effect plus selection bias).⁷ We view our LATE estimates from this setting as a possible upper bound on the positive relationship between the employment of immigrant workers and the performance of the organization, since compliers should be organizations poised to benefit the most from immigrant players.

Second, recall that all football clubs compete in a global market for talent. This means that when, for example, France makes it easier to hire immigrant workers, football clubs in *other* countries will face more competition for immigrant workers. Thus, liberalization of immigrant worker rules in one country might drive down the quality or drive up the wages of immigrant workers in other countries. This aspect of the instrument might violate the stable unit treatment assumption that is required for correct LATE estimates. To examine the extent of this problem, we measured how the average number of immigrant players that appear in the starting line-up in a given league changed as a result of the liberalization of immigrant worker rules in *other* leagues. We found very little correlation, suggesting that the market for immigrant workers is deep enough that these increases in demand-side competition do not have large spillover effects.

5. Mechanisms

⁷ Farre-Mensa, Hegde and Ljungqvist (2020) also found a LATE larger than the OLS estimate.

Now that we have found compelling evidence of a positive local average treatment effect of hiring more immigrants on organizational performance, we will return to using OLS specifications when exploring plausible mechanisms that could explain this relationship in the following sections. The primary advantage of using OLS rather than 2SLS in the remaining analysis is that it allows us to utilize *all matches*, not just international (UEFA, i.e. Europa and Champions) tournament matches, as the 2SLS specification requires. This provides us significantly more power and variation, which becomes especially important when moving beyond average effects.

5.1 Mechanism 1: Are Immigrants More Talented than Natives?

Immigrants might contribute to organizational performance because they are unusually talented compared to domestic employees. Numerous frictions including search costs, discrimination, and more might prevent immigrants from being hired, so any immigrants able to overcome these frictions and achieve employment with a domestic organization might be especially able or motivated. A testable implication of this mechanism is that immigrants should display higher levels of individual performance than natives, ultimately benefitting the organization for which they work. This argument has been put forth previously in the context of immigration by Borjas, Borjas, and Trejo (1992), with roots in Roy's (1951) classic study of the distribution of earnings.

While reasonably straightforward as an argument, testing this idea is extremely difficult in most real-world settings because of the challenges in objectively measuring an individual's contribution to collective outcomes. Once again, the football context provides unusual transparency in this regard while still displaying the mobility frictions that exist in other settings.

To test the “superior talent” mechanism, we obtained data on various measures of individual player quality. We consider five objective indicators: whether a player is chosen as one of the starters for a game (*starting lineup*), the number of goals scored in the game (*goals*), the pass completion rate (*pass rate*), the rate of successful dribbles (*dribble rate*), and the number of times the player touches the ball during a game (*touches*). Data on the first two metrics come from Transfermarkt and therefore cover our full sample. The latter three metrics are only available through WhoScored, so they are available only

during 2009/10-2018/19. None of these statistics by themselves indicate superior individual performance, but collectively they are compelling. We do note that these indicators tend to favor players involved in offensive play (midfielders and attackers) instead of those involved in defensive play (goalkeepers and defenders).

Figure 4 shows a graphical representation of the difference in the number of goals scored by domestic players compared to immigrant players over time, based on the raw data. Two things stand out: (1) immigrant players have a much higher goal average than domestic players, and (2) the gap has closed over time. The closure of the gap over time is consistent with the story of how foreign transfer rules evolved; in the early 1990s, very few foreigners could be hired in any of the five domestic leagues, but after the 1996 Bosman ruling each league's restrictions loosened to varying degrees. In other words, in the early 1990s, caps on immigrant players prevented all but the *very* best immigrants from moving to top European clubs. As the restrictions loosened, the height of the hurdle that foreign talent had to overcome to be signed by a top club also shrank. Notably, however, the gap is still quite large.

*** INSERT FIGURE 4 HERE ***

Regression results confirm the intuition from the raw data presented in Figure 4. Using all the variables mentioned before, we run models of this general form:

$$talent_{ig} = \alpha_{jsp} + \beta_1 immigrant_i + \beta_3 age_{is} + \beta_4 age_{is}^2 + \epsilon_{ig}$$

Note that, unlike in previous specifications, the regressions are at the individual-match level rather than at the club-match level. In the equation, $talent_{ig}$ represents one of the various measures of individual player quality for player i in match g . As before, the key variable of interest is the indicator $immigrant$, coded as 1 if the player was born in a foreign country and 0 otherwise. We control for the player's age in all models because it is a critical determinant of individual performance in the sport, and for club (j) by season (s) by position (p) fixed effects. Including such stringent fixed effects means that we are comparing talent metrics for immigrant and domestic players who play in the same position on the same club in the same season and league. Table 5 reports the results.

*** INSERT TABLE 5 HERE ***

We find that immigrant players, compared to domestic players, are 1.2% more likely to be named in the starting lineup (Column 1), score 0.007 more goals (Column 2), exhibit a 0.6% higher passing success rate (Column 3), and exhibit a 1.8% higher dribble success rate (Column 4). All these effects are significant at $p < 0.01$. Notably, immigrant players do not differ from domestic players in the number of times they have the ball during games. Immigrant players are thus more effective when they have possession, not because they have the ball more often. We also find that the market value of immigrant players is larger than that of domestic players (Column 6). Altogether, the results strongly support the notion that immigrant players contribute to collective performance because they are more talented.

5.2 Mechanism 2: Do Immigrants Improve Organizational Performance by Enhancing National Diversity?

Another mechanism by which hiring immigrants may enhance organizational performance is related to diversity, which we conceptualize as variety in employees' countries of birth, or national diversity, going forward. Research suggests that diversity can be beneficial for collective performance if groups are able to harness task conflict and minimize relational conflict arising from differences in perspectives (e.g. Page 2010). In particular, studies have linked diversity to innovation and creativity, arguing that organizations exposed to a higher variety of backgrounds, ideas, and perspectives are able to come up with more novel recombinations than those with more homogenous workforces (e.g. Brixy et al. 2020, Cooke and Kemeny 2017, Van Knippenberg and Schippers 2007). While there are many dimensions of diversity (e.g. racial, functional background), national diversity is one critical source of variety in ideas and perspectives. Knowledge embedded in a country may not easily transfer across borders due to its tacitness (Polanyi 1966), such that individuals from different national contexts will have different pools of knowledge to rely upon. These notions have been probed in the context of immigration. For example, Choudhury and Kim (2019) find that knowledge recombination is more likely to be pursued by organizations with inventors from different ethnic backgrounds. At the macro level, research on national innovation systems points to distinct institutional systems of knowledge production and application that create innovation

heterogeneity across countries (Nelson 1993). Individuals from different national contexts working for the same organization might also enhance diversity due to differences in life experience, education, and exposure to certain problems and paradigms.

But diversity is not guaranteed to enhance organizational performance. In fact, research suggests that diverse groups are more prone to conflict and face difficulties reaching consensus (e.g. Pelled 1996). Thus, we might expect decreasing returns to organizational performance from immigrant workers if immigrants introduce too much diversity and consensus becomes difficult to reach.

In the football context, there are some reasons to expect that diversity might be beneficial and other reasons to expect that diversity might not be as valuable as in other industries. Clubs with players representing many countries of birth may be able to draw from a variety of playing styles, tactics, and skill sets that can be combined and exploited in unique ways to outwit opponents. Indeed, colloquial discussions often focus on the distinct playing philosophies of different countries: the defensive “catenaccio” of Italy, the dribbling-heavy “jogo bonito” of Brazil, or the physical “kick and run” of England. Perhaps the most famous example of immigration and tactical innovation in the industry happened when Johan Cruyff moved from Ajax (Netherlands) to FC Barcelona (Spain) in the 1970’s and brought with him the uniquely Dutch “total football” approach to the game, involving highly intricate passing patterns inspired by field hockey. Cruyff revolutionized Barcelona’s style first as a player and then as a coach. But beyond anecdotes like these, there isn’t much evidence of whether national diversity consistently benefits collective performance.

At the same time, national diversity may not matter much in professional sports because every organization is heavily constrained by having to play by the same rules. Typical organizations have much more latitude in how many people they hire, how they structure the organization, and what strategies to follow. Sports organizations have fewer degrees of freedom, and competitive performance may be driven purely by differences in talent. And even if diversity mattered, it’s unclear whether nationality is the basis of diversity that matters in this context. Even further, diversity might even be harmful in football, where unity and cohesion are essential for clubs to react spontaneously to rapidly changing situations. The

problems of conflict and slow decision making documented by diversity research could thus be particularly damaging in our setting.

In short, whether diversity from hiring immigrants from various countries is helpful or hurtful for organizations—and in our unique context—is a theoretically and empirically open question. We turn to the data to better understand this issue.

From a descriptive perspective, one might also wonder whether top European football leagues truly exhibit much national diversity. We have already shown the growing prevalence of immigrant players over time on these clubs, but they could in theory be from just a few countries. Figure 5 shows that this is not the case. For example, the average number of unique countries represented on a club in the German Bundesliga today is six, and there is significant variation across countries and over time.

*** INSERT FIGURES 5 HERE ***

We subject the diversity mechanism to empirical testing by running variants of the following specification:

$$y_{gj} = \alpha_j + \alpha_{sl} + \beta_1 \text{diversity}_{gj} + \epsilon_{gj}$$

As before, y_{gj} measures the outcome of game g by club j . We only report the goal differential results for brevity, but the findings are robust to using the propensity to win as the outcome. The main variable of interest is diversity_{gj} , which we measure in several different ways based on the different nationalities, continents, subcontinents, or languages represented by the players in each club in any given match. For each of these four dimensions of national diversity, we employ different measures such as counting the number of unique instances or using a Blau index, as recommended by Harrison and Klein (2007). We also calculated the average cultural distance between all the players in a club and the average cultural distance between each player and the club's country, based on country-level data from Berry et al. (2010). We report a subset of these diversity measures in the following regression tables, but all versions are available upon request. All specifications include league-season and club fixed effects.

Table 6 contains results that, at first glance, appear to support the notion that immigrants improve organizational performance by enhancing national diversity (see Appendix IV for analysis predicting an alternative dependent variable). However, when we control for the number of immigrant players in the club, as shown in Table 7 (see Appendix V for analysis predicting an alternative dependent variable), the relationship between national diversity and performance actually becomes negative in specifications using the number of countries of birth represented by players as the measure of diversity, though the effect is non-significant when using other measures of diversity. Figure 6, which graphs a version of the Table 7 results, but for non-parametric versions of the two variables of interest, complements our results: the relationship between national diversity exhibits a flat, or perhaps slightly negative relationship with performance, whereas the number of immigrant players exhibits a clearly positive relationship with performance.

*** TABLES 6 AND 7 AND FIGURE 6 HERE ***

6. Exploring the Moderating Role of Immigrant Managers

So far, we have documented that hiring immigrants has a positive local average treatment effect on organizational performance in our setting. This effect seems to be driven, in part, by the above-average talent of foreigners compared to natives, but not by the diversity arising from hiring employees from a variety of national backgrounds. But the main effects of foreign talent and diversity might be insufficient to get the full picture of how individual talent and national diversity translate to collective performance. If an organization will benefit from hiring immigrants, someone needs to coordinate the efforts of talented workers and create the conditions for diversity to benefit the collective. We thus go deeper by examining whether immigrant *managers* moderate the relationships we have explored so far. This issue is crucial from an organizational strategy perspective because it gets at what firms must do to activate the potential gains of hiring immigrants. It also matters from a policy perspective because it points to the importance of immigrants in managerial roles—an issue seldom discussed in policy circles.

We focus on the immigrant status of the manager for two reasons. First, some studies hint that immigrant managers help firms unlock benefits from immigrant workers, but this relationship has not

been tested directly.⁸ Second, research that examines the role of leaders in driving employee performance suggests that an identity or demographic match between the manager and the employee can improve employee productivity (e.g. Ranganathan and Shivaram 2021, Zhang 2017). Even if an immigrant manager and immigrant employee are not co-nationals, their immigrant status still provides them with a shared identity as a foreigner in the focal country.

Just as the top five leagues attract players from all over the world, they also attract managerial talent from many foreign countries.⁹ Figure 7 shows the percentage of games from our data in which a club was managed by an immigrant manager, defined as a manager born in a different country than the home country of the club. The graph shows the increasing reliance of the English Premier League on managers from abroad. The same upward trend is not as apparent for other leagues.

*** INSERT FIGURE 7 HERE ***

We next examine empirically whether clubs with immigrant managers display a stronger positive relationship between hiring immigrant players and club performance, with results displayed in Table 8. Column 3 shows that clubs with immigrant managers exhibit a stronger positive relationship between the number of immigrant players and club performance, but only above a threshold of roughly four immigrant players. Each incremental immigrant player contributes a significant 0.03 goal differential for clubs with domestic managers ($p < 0.01$), and an extra 0.04 goal differential if the manager is an immigrant ($p < 0.01$). We reach a similar conclusion if the outcome is the probability of winning a game (see Appendix VI). Interestingly, this effect is not driven by immigrant managers being associated with better average club performance: columns 1 and 2 indicate that clubs with immigrant managers do not perform any better, on average, than domestic managers, and column 3 indicates that clubs with only one or two

⁸ Kulchina (2017) demonstrated that immigrant managers help startups lower costs if they hire co-national immigrant workers. Hernandez and Kulchina (2020) demonstrated that foreign startups benefitted most from the local immigrant population if they appointed immigrant CEOs. Thus, there is some precedent to expect that immigrant managers might be able to “extract” better performance from immigrant workers. However, those studies did not directly observe the immigrant workers, instead surmising they might be working for the firm based on the size of the immigrant population.

⁹ Anecdotally, immigrant players often appear to have success playing under immigrant managers (e.g. Arsenal in the English Premier League saw significant success with French nationals playing for French manager Arsene Wenger), but this is not backed by systematic evidence.

immigrant players actually have lower performance if they hire an immigrant manager. Thus, unlike immigrant players, immigrant managers do not seem to be unambiguously associated with high club performance. Their presence is only positively associated with club performance when the number of immigrant players passes a certain threshold.

*** INSERT TABLE 8 HERE ***

6.1 Immigrant Managers and the Talent of Immigrant Players

Table 9 revisits the results from Table 5, which explored the relationship between a player's foreign origin and individual performance. We find that immigrant players are more likely to appear in the club's starting lineup, and that they have more ball touches during the game, when the manager is also an immigrant. However, the presence of an immigrant manager is not associated with an increase in various measures of in-game effectiveness (e.g. goals scored, successful passes) or with an increase in player market value. Therefore, it does not seem like immigrant managers are simply attracting the most talented immigrant players or deploying them in such a way as to maximize their individual performance. Instead, the results in this section suggest that immigrant managers are simply more willing to deploy immigrant players, similar to Zhang's (2017) finding that basketball coaches give more playing time to players who share their racial identity.

*** INSERT TABLE 9 HERE ***

6.2 Immigrant Managers and National Diversity

In Table 8, columns 4-5 report whether immigrant managers moderate the relationship between player nationality diversity and club performance. The results reveal a positive effect once there are more than 3 countries represented on the club. Recall that player national diversity and immigrant managers both have a negative relationship with club performance. A possible interpretation of these results is that that immigrant managers help clubs overcome the initially negative effects of increased national diversity (e.g. perhaps by more effectively integrating the immigrant players into the club), potentially activating the latent benefits above a certain threshold. However, more work is needed to address this possibility.

7. Discussion

We demonstrate that immigrants improve an organization's competitive performance. We find that European football clubs that hire an additional immigrant player tend to outscore their opponents in international (i.e. UEFA) competition—which represents the toughest competition by pitting the best teams from each country against one another. We justify a causal interpretation of this relationship by using an instrumental variable approach common in the trade literature. Next, we explored two mechanisms by which immigrant workers might improve the performance of their clubs: superior talent and enhanced national diversity. Our analyses provide clear support for the talent mechanism. We find no evidence that national diversity from hiring immigrant players enhances club performance directly. However, when the club's manager is also an immigrant, we find a positive relationship between national diversity and performance. Moreover, the positive relationship between club performance and the employment of immigrant players is even stronger when a club also has an immigrant manager.

While we cannot be sure about the causality of the findings pertaining to immigrant managers, it is useful to articulate why immigrant managers might lead to a causal increase in the relationship between hiring immigrant workers and organizational performance, in the spirit of our abductive approach. Prior work already hints at the possibility that immigrant managers might get the best results from immigrant employees (e.g. Hernandez and Kulchina 2020). We suggest three mechanisms by which immigrant managers might have this effect: a selection channel, a motivation channel, and a cohesion channel. With regard to selection, an immigrant manager might better assess the performance of migrant employees (Castilla 2011) and have superior contacts around the world that allow them to identify and secure the services of the best immigrant workers (e.g. Wang 2015). We did not find evidence that clubs with immigrant managers fielded players with higher individual talent than clubs without immigrant managers—suggesting that the selection effect is not at play in our setting. Yet selection mechanisms could occur in other industries.

With regard to motivation, the immigrant manager might be better able to empathize with immigrant workers, connect with them, and motivate them to perform their best (e.g. Tsui and O'Reilly 1989). We find some support for this notion: the performance benefits of immigrants are especially strong

in our context when the club has many immigrant players, suggesting that immigrant managers get more productivity out of a large group of immigrant employees.

On the cohesion side, immigrant managers might be better able to create linkages between immigrant workers and native workers, owing to the manager's multiplex identity as an immigrant and a high-status figure (DiBenigno and Kellogg 2014). We noted earlier that research suggests that the recombination of diverse ideas and skills allows firms to be more innovative. The expectations or normative beliefs about the value of cultural diversity can affect collaboration (DiBenigno and Kellogg 2014) and moderate the effect of diversity on the effectiveness of organizational processes (Ely and Thomas 2001). Having an immigrant manager who can foster cohesion among workers of different nationalities is crucial to minimize the interpersonal conflict arising from diversity that we also discussed earlier. As a result, an immigrant manager might provide value by limiting the downsides and enhancing the upsides of diversity. Our findings seem to provide support for the cohesion mechanism, because the benefits of national diversity appear to be activated only in the presence of an immigrant manager.

We reported earlier that immigrant managers do not have a direct positive relationship with club performance. Indeed, immigrant managers have a negative impact on performance when the club has very few immigrant players, and the relationship only becomes positive after the club has several immigrant players (more than 4 immigrant players in our context). This raises an intriguing question: if immigrant players benefit their organizations through unusually high skill, why would we not see the same effect for immigrant managers? We recognize that this may not be the case in other industries, but we leave it as an open question for future research.

7.1 Limitations

Our setting is not uniformly generalizable; it is characterized by small organizations, human capital-intensive competition, and a production process that both is relatively uniform (i.e. the rules of football are the same everywhere) and does not require very high levels of proficiency in the native language or the native culture. Additionally, the international labor market in our setting is quite active and employee performance is relatively visible to organizations around the world.

We submit that many economically meaningful settings that are the focus of current immigration debates share these characteristics. For example, our results should be relevant to settings where highly technical expertise, embodied in visible publications, patents, or software, is more important than cultural knowledge (e.g. Clemens 2013). Such features are often the focus of the H1-B program in the US, for example. Our results should also apply to settings which are labor-intensive but do not require cultural knowledge, such as agricultural work, such as the H2-A program in the U.S. By contrast, our results are less likely to apply to situations where native language and cultural knowledge are significant drivers of productivity (e.g. Neeley 2012), such as sales and marketing, or in situations where labor markets are not international in scope.

One critical difference between professional football and other industries is that firms in our setting do not seek to maximize profits and, in many cases, only break even or even operate at a loss. The most prominent clubs are in a constant spending battle to attract the most talented players in pursuit of winning prestigious leagues and tournaments. Because talent is, essentially, the only production input, players and (to a lesser extent) managers appropriate most of the economic value through their wages and other contractual clauses (e.g., image rights). Consequently, football clubs do not compete on profitability (Garcia-del-Barrio and Szymanski 2009); they maximize revenues (through TV rights, sponsorships, merchandise, and ticket sales – in that order of importance) so they can continue to afford the best talent possible. This creates a generalizability issue: the marginal benefit of hiring skilled immigrants may differ in settings where profit maximization is more important, because the best talent may not be cost effective.

The local average treatment effect we estimate constitutes a vital data point for the literature concerned with the link between immigrants and organizational performance specifically, and for the literature on immigration and economic growth more generally. It is among the first plausibly causal estimates of the effect that foreign employees have on firm performance (see also Dimmock et al. 2019, Doran et al. 2014). Moreover, because we have access to employer-employee linked data and fine-grained measures of individual performance and collaboration, we can unpack the mechanisms and moderators that might drive the relationship.

7.2 Future Work

We see three important paths for future work. The first involves discovering boundary conditions. Under what circumstances do firms struggle to obtain performance benefits from immigrant workers? Our paper shows a possible path forward, because we document a modest, noisy, negative relationship between national diversity and club performance. Future work can push in this direction, trying to understand the conditions under which the drawbacks of national diversity outweigh their benefits for organizations. We have taken one step in this direction by exploring the moderating role of immigrant managers, but many other factors we have not considered are surely at play.

Second, we see an exciting opportunity for researchers to further understand *why* immigrant workers seem to improve performance, especially competitive performance. We suggest that immigrant workers, since they are drawn from a larger, more friction-filled labor market than natives, tend to be more talented than natives. This logic inherently assumes that workers are only *vertically* differentiated. However, it is also possible that workers are *horizontally* differentiated (Peri and Sparber 2009), and immigrant workers bring unusual skills and abilities that allow their employing organizations to implement different strategies and tactics than their competitors. And for management scholars, understanding how such horizontal differentiation among immigrants can be a basis for firms to develop unique strategies to outflank their rivals is an especially important but still unaddressed question.

Finally, we see an opportunity for organizational researchers to study how firms identify and evaluate immigrant workers in global labor markets. For example, an intriguing pattern we noticed in our data is that foreign footballers tend to play in positions (e.g. striker) where individual performance in the form of goals scored is easier to observe. Thus, it seems possible that organizations—even in this setting with robust international labor market institutions—may have trouble evaluating immigrant workers in the absence of easily observable signals of individual quality. Firms able to overcome this problem should reap significant rewards as labor markets continue to globalize.

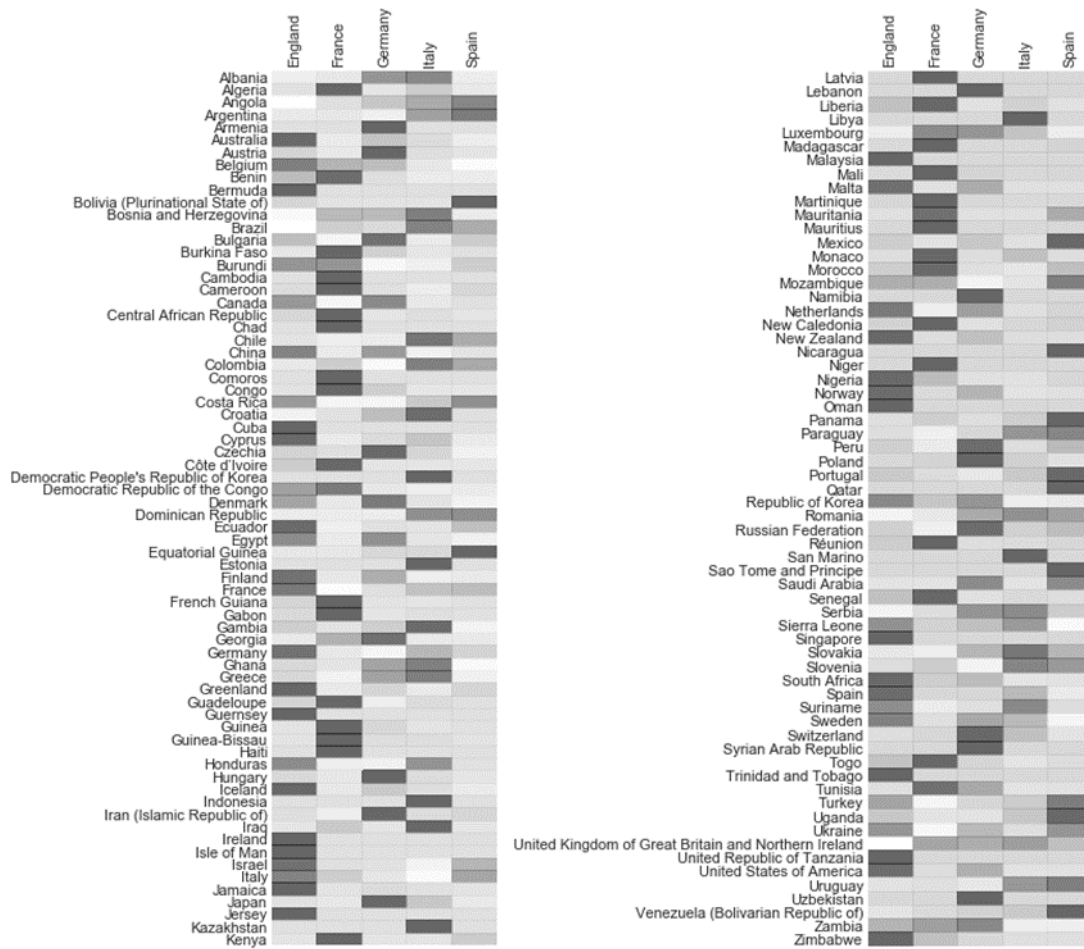
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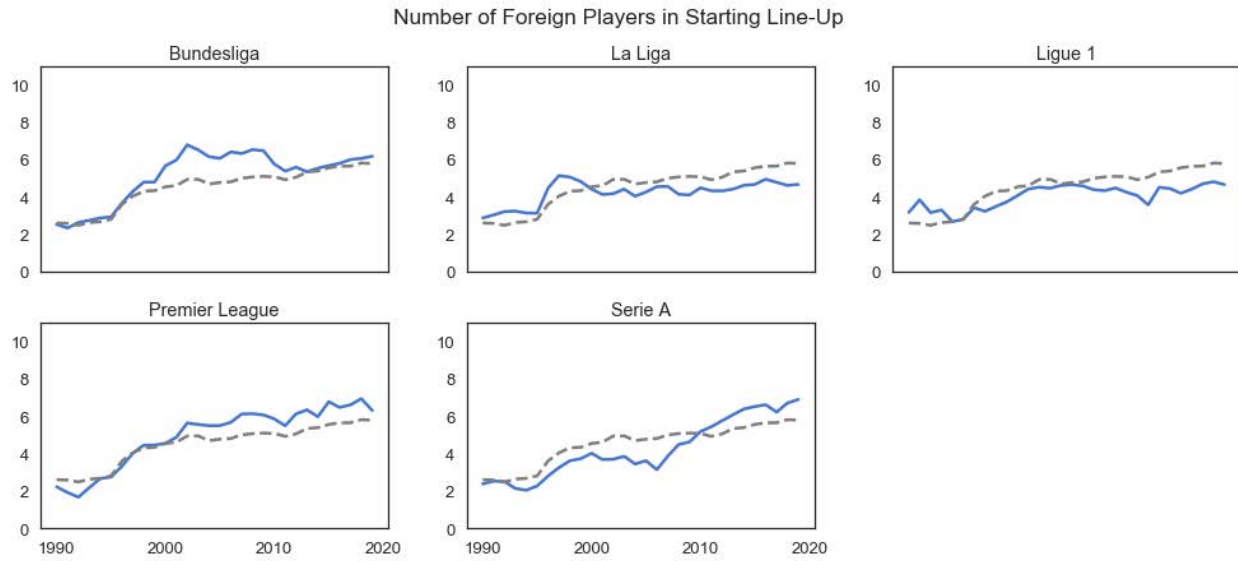
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Figure 1: Football League by Players' Country of Birth



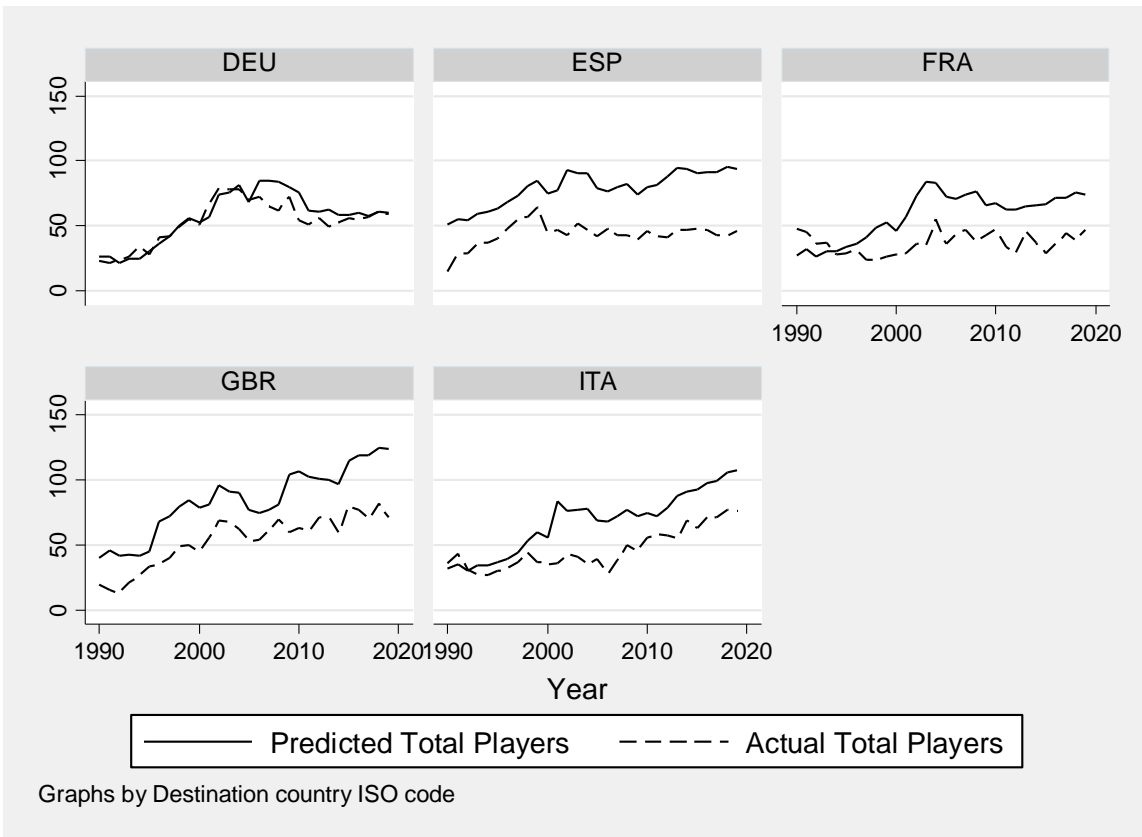
Notes: The graph shows the football league for players from each country of birth represented in our sample (1990/91 to 2019/20). Leagues are listed on the X axis and countries of birth on the Y axis. We aggregate the total number of players, by country of birth and league, that played at least one game from the start of the match (i.e. player in starting line-up). The totals are standardized by country of birth. The darkest color shows that a large percentage of the players from the country of birth play in that league. For instance, Algerian players in the top 5 European leagues are most likely to play in France.

Figure 2: Number of Foreign Players in Starting Line-up Over Time



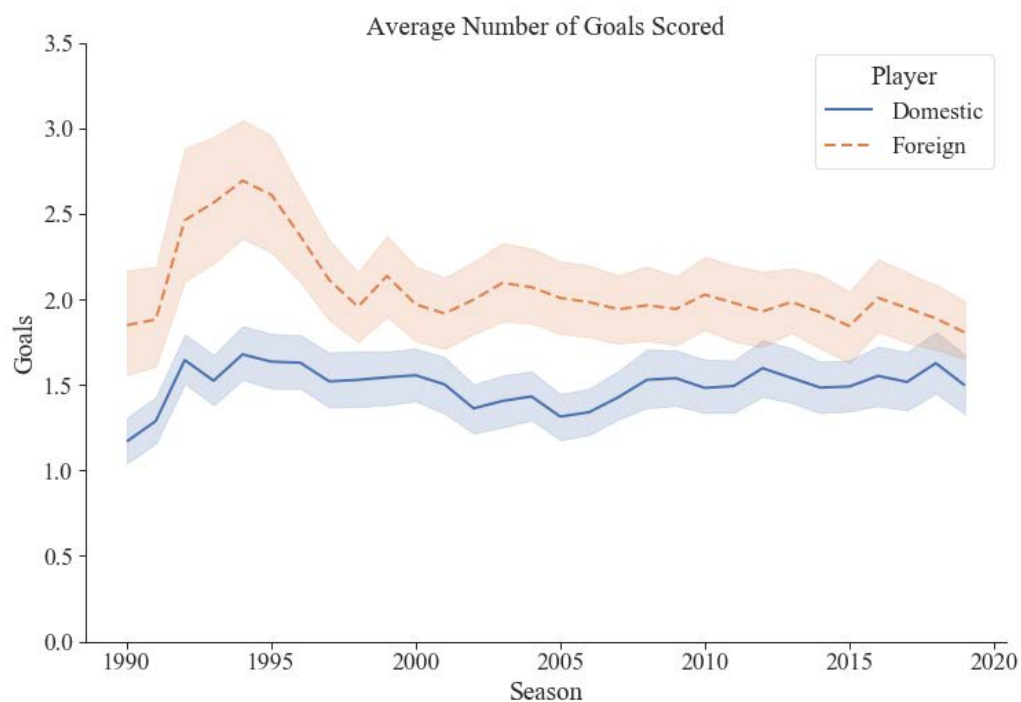
Notes: These graphs show the average number of immigrant players in the starting line-up for clubs in different leagues over time. The dashed line shows the average across all leagues for each season. Bundesliga=Germany, La Liga=Spain, Ligue 1=France, Premier League=England/Great Britain, Serie A=Italy

Figure 3: Correlation Between the Instrumental Variable and Actual Foreign Players



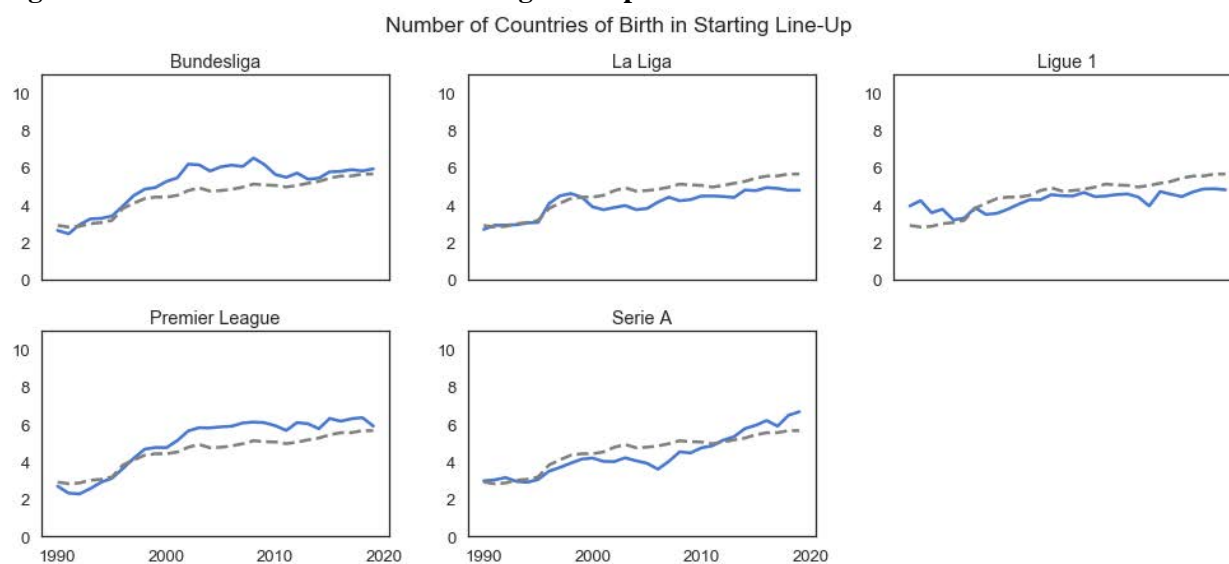
Notes: The graph shows the predicted number of foreign players and the actual number of foreign players for each season by league.

Figure 4: Average Number of Goals Scored by Foreign vs. Domestic Players



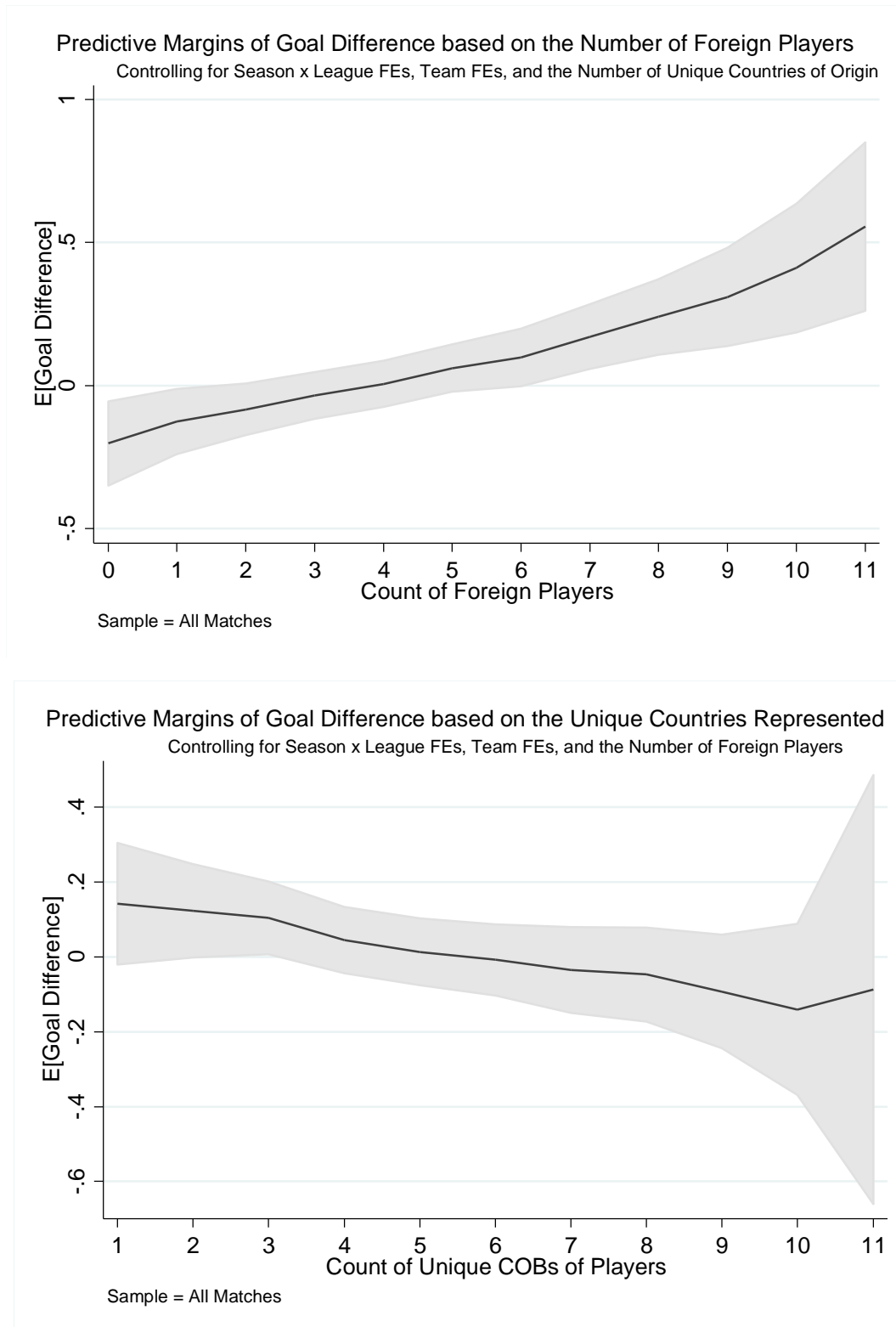
Notes: The graph shows the average number of goals scored by foreign vs. domestic players. The data includes all domestic league matches. These graphs are composed of raw data without controls or fixed effects. The error bars are bootstrapped 95% confidence intervals.

Figure 5: Number of Countries in Starting Line-up



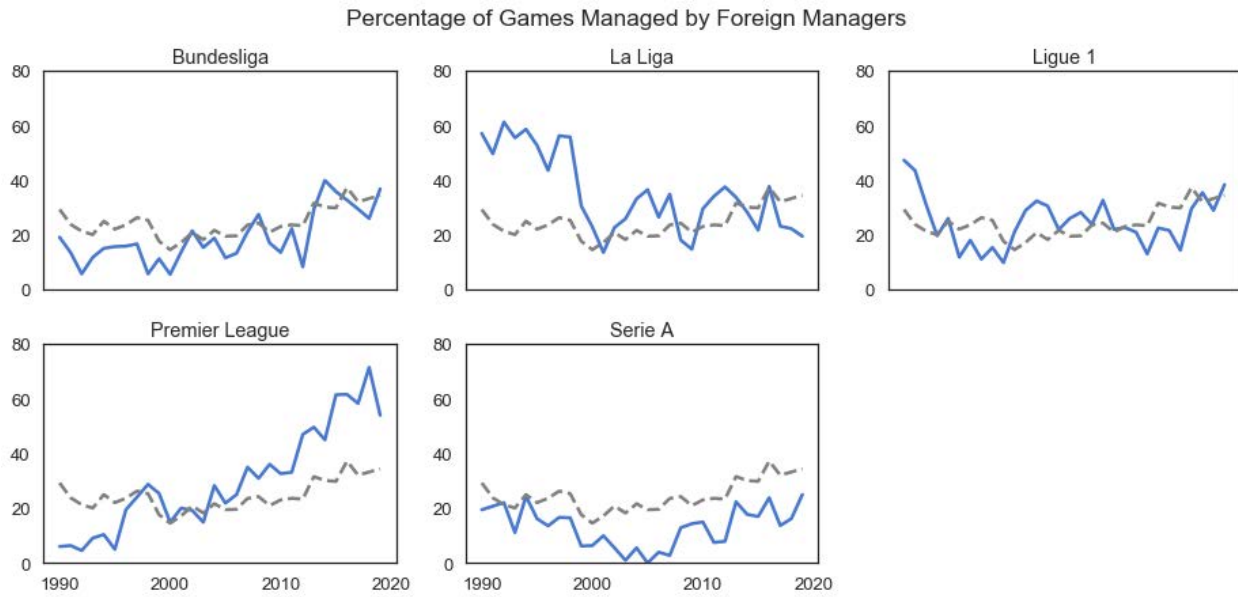
Notes: These graphs show the average number of countries of birth represented in the starting line-up for a club across all the seasons. Dashed line shows the average across all leagues for each season. Bundesliga=Germany, La Liga=Spain, Ligue 1=France, Premier League=England/Great Britain, Serie A=Italy

Figure 6: Predictive Margins: National Diversity and Number of Foreign Players



Note: The graphs display the predictive margins of Goal Difference bases on Unique Countries of Birth (COB) and the Number of Foreign Players.

Figure 7: Percentage of Games Managed by Foreign Managers



Notes: These graphs show the percentage of the matches in which an immigrant manager coached a club. Managers are classified as foreign by their country of birth. Dashed line shows the average across all domestic leagues for each season. Bundesliga=Germany, La Liga=Spain, Ligue 1=France, Premier League=England/Great Britain, Serie A=Italy

Table 1a: Maximum Number of Immigrant Players Allowed

Season	England Premier League ^b		Spain La Liga		Italy Series A ^c		Germany Bundesliga ^d		France Ligue 1	
	Roster	Field	Roster	Field	Roster	Field	Roster	Field	Roster	Field
1990	3 ^a	3 ^a	3	3	5	3	2	2	3	3
1991	3 ^a	3 ^a	4	3	5	3	2	2	3	3
1992	3 ^a	3 ^a	4	3	5	3	3	3	3	3
1993	3 ^a	3 ^a	4	3	5	3	3	3	3	3
1994	3 ^a	3 ^a	4	3	5	3	3	3	3	3
1995	3 ^a	3 ^a	4	3	5	3	3	3	3	3
1996	25	11	6	4	5	3	3	3	5	3
1997	25	11	6	4	5	3	3	3	5	3
1998	25	11	6	4	5	3	3	3	5	3
1999	25	11	6	4	5	3	3	3	5	3
2000	25	11	5	3	5	3	3	3	5	3
2001	25	11	4	3	25	11	3	3	5	5
2002	25	11	4	3	3	3	3	3	5	5
2003	25	11	4	3	3	3	3	3	5	5
2004	25	11	3	3	3	3	5	5	5	5
2005	25	11	5	3	3	3	4	4	5	5
2006	25	11	5	3	3	3	25	11	5	5
2007	25	11	5	3	3	3	25	11	5	5
2008	25	11	5	3	3	3	25	11	5	5
2009	25	11	5	3	3	3	25	11	5	5
2010	25	11	5	3	3	3	25	11	5	5
2011	25	11	5	3	3	3	25	11	5	5
2012	25	11	5	3	3	3	25	11	5	5
2013	25	11	5	3	3	3	25	11	5	5
2014	25	11	5	3	3	3	25	11	5	5
2015	25	11	5	3	3	3	25	11	5	5
2016	25	11	5	3	3	3	25	11	5	5
2017	25	11	5	3	3	3	25	11	5	5
2018	25	11	5	3	3	3	25	11	5	5
2019	25	11	5	3	3	3	25	11	5	5

Notes:

^a Clubs were also allowed to employ 2 “assimilated players”, defined as those that played for 5 consecutive years in the country or started playing in the country at the youth level.

^b There were changes in visa rules for the UK as a whole during this time that significantly affected the ability of clubs to sign immigrant players, but these were separate from Premier League rules regarding how many foreign players a club could have. The Premier League also implemented the Home-Grown Player criteria at the start of the 2010/2011 season (see Appendix II).

^c In the post-2001 period, Italy tended to restrict the signing of *new* players that are non-EU born.

^d Since the 2006/2007 season, there has been a “local player” limit. Though the Bundesliga requires clubs to register a certain number of homegrown players, there is no upper limit on the number of players a German club can register each season. Appendix II provides more detail.

Table 1b: Countries/Regions Not Considered Foreign by League

Season	England Premier League	Spain La Liga	Italy Serie A	Germany Bundesliga	France Ligue 1
1990	None	None	None	None	None
1991	None	None	None	None	None
1992	None	None	None	None	None
1993	None	None	None	None	None
1994	None	None	None	None	None
1995	None	None	None	None	None
1996	EU	EU	EU	UEFA	EU
1997	EU	EU	EU	UEFA	EU
1998	EU	EU	EU	UEFA	EU
1999	EU	EU	EU	UEFA	EU
2000	EU	EU	EU	UEFA	EU
2001	EU	EU	EU	UEFA	EU
2002	EU	EU	EU	UEFA	EU
2003	EU	EU	EU	UEFA	EU + Cotonou
2004	EU	EU	EU	UEFA	EU + Cotonou
2005	EU	EU + Russia	EU	UEFA	EU + Cotonou
2006	EU	EU + Russia	EU	UEFA	EU + Cotonou
2007	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2008	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2009	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2010	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2011	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2012	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2013	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2014	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2015	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2016	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2017	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou
2018	EU	EU + Russia + Cotonou	EU	UEFA	EU + Cotonou

Notes: There were EU enlargements in 2004, 2007, and 2013 that changed the number of countries considered to be non-foreign for all leagues. “Cotonou” refers to countries party to the Cotonou Agreement between 78 African, Caribbean, and Pacific states and 15 EU member states. Please see Appendix II for more detail.

Table 1c: Descriptive Statistics at the Club-Match Level

	(1) All Matches	(2) Domestic Matches	(3) International Tournament Matches
Goal difference	0.04 (1.79)	0.00 (1.78)	0.51 (1.86)
Win	0.37 (0.48)	0.37 (0.48)	0.48 (0.50)
Number of immigrant players	4.37 (2.36)	4.29 (2.34)	5.46 (2.34)
Immigrant manager	0.25 (0.43)	0.24 (0.43)	0.34 (0.47)
Count of unique birth countries	4.64 (1.85)	4.59 (1.85)	5.34 (1.78)
Shannon index of unique birth countries	1.13 (0.52)	1.11 (0.52)	1.34 (0.47)
Blau index of unique birth countries	0.55 (0.22)	0.54 (0.22)	0.64 (0.19)
Count of unique languages	3.67 (1.59)	3.63 (1.59)	4.23 (1.53)
Avg cultural dist. between all players	6.17 (3.91)	6.09 (3.92)	7.23 (3.68)
Avg cultural dist. between destination country and each player	4.29 (3.63)	4.20 (3.58)	5.47 (4.05)
<i>N</i>	111685	103735	7950

Note: International Tournament Matches are composed of Europa League and Champions League matches.

Table 1d: Correlations Among Key Variables (Club-Match Level)

	1	2	3	4	5	6	7	8	9	10
1	Goal difference	1.000								
2	Win	0.772***	1.000							
3	Number of immigrant players	0.098***	0.095***	1.000						
4	Immigrant manager	0.056***	0.046***	0.221***	1.000					
5	Count of unique birth countries	0.078***	0.077***	0.901***	0.180***	1.000				
6	Shannon index of unique birth countries	0.085***	0.083***	0.952***	0.193***	0.978***	1.000			
7	Blau index of unique birth countries	0.085***	0.083***	0.948***	0.189***	0.932***	0.985***	1.000		
8	Count of unique languages	0.070***	0.070***	0.780***	0.144***	0.851***	0.835***	0.796***	1.000	
9	Avg cultural dist between all players	0.052***	0.055***	0.706***	0.144***	0.745***	0.756***	0.741***	0.697***	1.000
10	Avg cultural dist between dest country and each player	0.070***	0.069***	0.765***	0.224***	0.726***	0.739***	0.711***	0.665***	0.904***

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

There are 111,353 club-match observations where all variables have non-missing values. Please note that the high collinearity among measures of national diversity (i.e. variables 5-10) is expected, and these variables are never included in the same regression models.

Table 2: Baseline (“Naïve”) OLS Results

Sample	All Matches				All UEFA Tournament Matches			
	(1) Goal difference	(2) Goal difference	(3) Pr(win)	(4) Pr(win)	(5) Goal difference	(6) Goal difference	(7) Pr(win)	(8) Pr(win)
Number of immigrant players	0.107*** (0.0117)	0.0374*** (0.00721)	0.0249*** (0.00265)	0.00969*** (0.00169)	0.0575*** (0.0121)	0.0304** (0.0153)	0.0116*** (0.00315)	0.00752* (0.00448)
Constant	-0.432*** (0.0462)	-0.128*** (0.0315)	0.264*** (0.0107)	0.331*** (0.00739)	0.196** (0.0865)	0.344*** (0.0835)	0.413*** (0.0213)	0.435*** (0.0245)
Observations	111,512	111,512	111,685	111,685	7,777	7,777	7,950	7,950
R-squared	0.019	0.070	0.014	0.049	0.011	0.047	0.007	0.033
Season x League FE	YES	YES	YES	YES	YES	YES	YES	YES
Focal Club FE		YES		YES		YES		YES

Notes: The level of analysis is the club-match. Sample period = 1990/91-2019/20. Models 1-4 include all matches, domestic and international. Models 5-8 include only the international matches (played during Europa and Champions tournaments). For domestic matches, the League in Season X League FE includes Premier, Serie A, La Liga, Bundesliga, and Ligue 1. For international matches, the League in Season X League FE includes Europa and Champions. Standard errors clustered at the club level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: Gravity Model Instrument Construction

	DV = Total Immigrant players			DV = Avg Immigrant players		
	(1) 30%	(2) 50%	(3) 70%	(4) 30%	(5) 50%	(6) 70%
Is player from origin country considered "immigrant"	0.411*** (0.146)	0.273** (0.106)	0.157** (0.0651)	0.0212*** (0.00742)	0.0140*** (0.00543)	0.00811** (0.00334)
Max immigrant players allowed on the field	0.0308** (0.0148)	0.0259** (0.0111)	0.0170** (0.00687)	0.00170** (0.000751)	0.00142** (0.000567)	0.000932*** (0.000356)
UK Visa Change 1	0.287 (0.185)	0.254* (0.144)	0.167* (0.0868)	0.0146 (0.00926)	0.0129* (0.00722)	0.00849* (0.00435)
UK Visa Change 2	0.172 (0.161)	0.111 (0.126)	0.110 (0.0804)	0.00811 (0.00809)	0.00516 (0.00633)	0.00522 (0.00406)
Origin Country Population	7.66e-09* (4.37e-09)	5.16e-09* (2.88e-09)	2.98e-09* (1.57e-09)	3.83e-10* (2.18e-10)	2.58e-10* (1.44e-10)	1.50e-10* (7.81e-11)
Destination Country Population	-1.58e-08 (3.15e-08)	-8.11e-09 (2.23e-08)	-9.15e-09 (1.23e-08)	-6.63e-10 (1.57e-09)	-2.71e-10 (1.12e-09)	-3.50e-10 (6.18e-10)
Origin GDP per capita	2.32e-06 (4.04e-06)	1.56e-06 (3.01e-06)	5.36e-07 (1.75e-06)	1.35e-07 (2.05e-07)	9.03e-08 (1.53e-07)	3.22e-08 (8.82e-08)
Destination GDP per capita	-7.23e-05*** (2.63e-05)	-5.21e-05*** (1.90e-05)	-3.20e-05*** (1.22e-05)	-3.43e-06** (1.33e-06)	-2.48e-06** (9.74e-07)	-1.52e-06** (6.33e-07)
Constant	3.609 (2.414)	2.394 (1.691)	1.711* (0.941)	0.167 (0.118)	0.107 (0.0832)	0.0765 (0.0467)
Observations	17,150	17,150	17,150	17,150	17,150	17,150
R-squared	0.728	0.704	0.649	0.731	0.706	0.650
Country Dyad and Year FEs	YES	YES	YES	YES	YES	YES

Notes: The level of analysis is a source country-destination country-year. The dependent variable in each model is Z_{odt} from Equation 2. Each column shows a slightly different measure of Z_{odt} based on the percentage of matches an immigrant player must have been in the starting lineup to be counted towards a club's limit on immigrant players. The columns also vary across another dimension: in columns 1-3, we predict the total number of immigrant players in the country, while in 4-6 we predict the average number of immigrant players per club. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Second Stage Results (2SLS Models)

	DV = Goal Difference				DV = Pr(win)			
	(1) Avg, 50%	(2) Total, 50%	(3) Avg, 70%	(4) Total, 70%	(5) Avg, 50%	(6) Total, 50%	(7) Avg, 70%	(8) Total, 70%
Number of immigrant players	0.124** (0.0578)	0.171* (0.0868)	0.168** (0.0672)	0.219** (0.103)	0.0221* (0.0122)	0.0333* (0.0185)	0.0329** (0.0144)	0.0451** (0.0223)
Observations	7,777	7,777	7,777	7,777	7,950	7,950	7,950	7,950
Season x League FE	YES	YES	YES	YES	YES	YES	YES	YES
First stage F	26.72	20.81	25.10	17.85	26.58	20.76	24.93	17.76

Notes: The level of analysis is the club-game. The sample consists of all international matches from 1990/91-2019/20 in the Europa and Champions Leagues. The column headings describe the decision rules used to construct the dependent variable in the first stage regression (see footer to Table 3). Standard errors clustered at the club level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Are Immigrant Players More Talented than Natives?

	(1) Starting Lineup	(2) Goals	(3) Pass Rate	(4) Dribble Rate	(5) Touches	(6) Market Value
Immigrant Player	0.012*** (0.003)	0.007*** (0.001)	0.006*** (0.001)	0.018*** (0.002)	-0.294 (0.201)	0.740*** (0.026)
Age	0.199*** (0.004)	0.032*** (0.001)	-0.003** (0.001)	0.020*** (0.003)	6.032*** (0.243)	2.121*** (0.036)
Age ²	-0.003*** (0.000)	-0.001*** (0.000)	0.000** (0.000)	-0.000*** (0.000)	-0.103*** (0.004)	-0.039*** (0.001)
Matches in Starting Lineup						0.115*** (0.001)
Constant	-2.204*** (0.049)	-0.376*** (0.013)	0.788*** (0.015)	0.070* (0.037)	-41.285*** (3.297)	-19.217*** (0.474)
Observations	1,691,653	1,691,653	484,917	487,647	487,647	44,032
R-squared	0.039	0.002	0.000	0.004	0.013	0.466
Number of Groups	11,659	11,659	3,918	3,918	3,918	6,269
Club-Season-Position FE	Y	Y	Y	Y	Y	Y
Level	Player-Match	Player- Match	Player- Match	Player- Match	Player-Match	Player-Season
Data Source	Transfermarkt	Transfermar kt	WhoScored	WhoScore d	WhoScored	Transfermarkt

Notes: The level of analysis is the player-match in models 1-5 and the player-season in model 6. The sample sizes differ across models because of the data source: WhoScored is available during 2009/10-2018/29; Transfermarkt during 1990/91-2019/20.

Because we only have event-data from WhoScored for domestic games, we restrict the analysis to domestic matches.

The indicator *Immigrant Player* = 1 if the player was born abroad. *Starting Lineup* is a dummy indicating whether the player is in the starting lineup. *Goals* is a count of the number of goals scored by the player in the match. *Pass rate* is the ratio of successful passes to total passes attempted by the player during the match. *Dribble rate* is the ration of successful to total dribbles during the match. *Touches* measures the number of times the player touched the ball during the match. *Market value* is the natural log of the player's market value during the season. *Matches in Starting Lineup* is the number of times the player was in the starting lineup during the season. Standard errors are clustered at the club-season level (and remain unchanged if clustered at player level). *** p<0.01, ** p<0.05, * p<0.1

Table 6: Is National Diversity Associated with Higher Club Performance?

	(1) Goal difference	(2) Goal difference	(3) Goal difference	(4) Goal difference	(5) Goal difference	(6) Goal difference
Count of unique birth countries	0.0266*** (0.00695)					
Shannon index of unique birth countries		0.121*** (0.0280)				
Blau index of unique birth countries			0.295*** (0.0670)			
Count of unique languages				0.0247*** (0.00837)		
Avg cultural dist between all players					0.0101** (0.00461)	
Avg cultural dist. between destination country and each player						0.0259*** (0.00595)
Constant	-0.0879*** (0.0323)	-0.101*** (0.0316)	-0.126*** (0.0366)	-0.0551* (0.0308)	-0.0269 (0.0284)	-0.0753*** (0.0255)
Observations	111,512	111,512	111,512	111,512	111,471	111,498
R-squared	0.069	0.069	0.069	0.069	0.069	0.069
Season x League FE	YES	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES	YES

Notes: The unit of observation is the club-match. The sample consists of all matches (international and domestic) during 1990/91-2019/20. For domestic matches, the League in Season X League FE includes Premier, Serie A, La Liga, Bundesliga, and Ligue 1. For international matches, the League in Season X League FE includes Europa and Champions. *Count of unique birth countries* records the number of birth countries on the club's starting lineup in the game. *Count of unique languages* records the number of languages based on the main language of each player's country of birth. The cultural distance measures are calculated by matching the cultural distance from Berry et al. (2010) to all the pairs of countries in a club based on the country of birth of the players and the club's destination country. We averaged the cultural distance between all pairs of players (*Avg cultural dist. between all players*) and we also averaged the cultural distance between each player and the club's country (*Avg cultural dist. between destination country and each player*). Robust standard errors in parentheses. Standard errors clustered at the club level. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Is National Diversity Associated with Higher Club Performance When Controlling for the Number of Immigrant Players?

	(1) Goal difference	(2) Goal difference	(3) Goal difference	(4) Goal difference	(5) Goal difference	(6) Goal difference
Count of unique birth countries	-0.0303** (0.0132)					
Shannon index of unique birth countries		-0.180** (0.0792)				
Blau index of unique birth countries			-0.367* (0.193)			
Count of unique languages				-0.0150 (0.00942)		
Avg cultural dist. between all players					-0.0103 (0.00629)	
Avg cultural dist. between dest. country and each player						0.00622 (0.00884)
Number of immigrant players	0.0584*** (0.0130)	0.0743*** (0.0194)	0.0689*** (0.0199)	0.0446*** (0.00864)	0.0474*** (0.00986)	0.0313*** (0.0107)
Constant	-0.0788** (0.0321)	-0.0857*** (0.0306)	-0.0646* (0.0373)	-0.104*** (0.0343)	-0.108*** (0.0320)	-0.128*** (0.0315)
Observations	111,512	111,512	111,512	111,512	111,471	111,498
R-squared	0.070	0.070	0.070	0.070	0.070	0.070
Season x League FE	YES	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES	YES

Notes: See notes for Table 6. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Immigrant Managers and Club Performance

	(1) Goal difference	(2) Goal difference	(3) Goal difference	(4) Goal difference	(5) Goal difference
Immigrant manager	0.0222 (0.0341)	0.00517 (0.0325)	-0.168*** (0.0576)	0.00429 (0.0328)	-0.183*** (0.0679)
Number of Immigrant players on club		0.0374*** (0.00704)	0.0277*** (0.00768)	0.0585*** (0.0128)	0.0593*** (0.0128)
Immigrant manager x Number of Immigrant players			0.0357*** (0.0128)		
Number of Unique Countries of Birth				-0.0305** (0.0132)	-0.0408*** (0.0142)
Immigrant manager x Number of Unique Countries					0.0376*** (0.0144)
Constant	0.0300*** (0.00855)	-0.129*** (0.0330)	-0.0905*** (0.0334)	-0.0798** (0.0334)	-0.0377 (0.0357)
Observations	111,389	111,389	111,389	111,389	111,389
R-squared	0.069	0.070	0.070	0.070	0.070
Season x League FE	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES

Notes: The level of analysis is the club-match. The sample includes all matches (domestic and international) during 1990/91-2019/20. Robust standard errors in parentheses. Standard errors clustered at the club level. *** p<0.01, ** p<0.05, * p<0.1

Table 9. Immigrant Managers and Player Talent

	(1) Starting Lineup	(2) Goals	(3) Pass Rate	(4) Dribble Rate	(5) Touches	(6) Market Value
Immigrant Player	0.007* (0.003)	0.006*** (0.001)	0.006*** (0.001)	0.017*** (0.003)	-0.623*** (0.225)	0.764*** (0.032)
Immigrant Manager	-0.008*** (0.003)	-0.002 (0.002)	-0.001 (0.003)	-0.006 (0.005)	-0.434 (0.410)	0.631*** (0.120)
Immigrant Player x Immigrant Manager	0.021*** (0.006)	0.003 (0.002)	-0.002 (0.002)	0.006 (0.005)	1.161*** (0.427)	-0.079 (0.056)
Age	0.199*** (0.004)	0.032*** (0.001)	-0.003** (0.001)	0.020*** (0.003)	6.028*** (0.242)	2.119*** (0.036)
Age ²	-0.003*** (0.000)	-0.001*** (0.000)	0.000** (0.000)	-0.000*** (0.000)	-0.103*** (0.004)	-0.038*** (0.001)
Matches in Starting Lineup						0.115*** (0.001)
Constant	-2.202*** (0.049)	-0.375*** (0.013)	0.788*** (0.015)	0.072* (0.037)	-41.096*** (3.297)	-19.385*** (0.473)
Observations	1,690,225	1,690,225	484,889	487,619	487,619	44,032
R-squared	0.039	0.002	0.000	0.004	0.013	0.467
Number of Groups	11,659	11,659	3,918	3,918	3,918	6,269
Club-Season-Position FE	Y	Y	Y	Y	Y	Y
Level	Player-Match	Player-Match	Player-Match	Player-Match	Player-Match	Player-Season
Data Source	Transfermarkt	Transfermarkt	WhoScored	WhoScored	WhoScored	Transfermarkt

Notes: See the notes in Table 5. *** p<0.01, ** p<0.05, * p<0.1

Appendix I: Characteristics of the International Football Labor Market

The labor market in the football industry has several characteristics that are important to understand as the institutional context of this study. Other than the rules and restrictions on the number and definition of “foreign” players, which we explain in the main text, the market operates with few restrictions. Clubs and players can bargain unrestrictedly for whatever market-based salary they agree upon. As in any professional sport, players have agents who negotiate on their behalf. Players sign contracts with clubs for a specific period and salary, but there are no rules (other than basic contract law) that bind players or clubs to each other for the entire duration of the contract. Any club wishing to sign a player at another club, even if that player is under contract, can make a bid for that player’s services to the club in which the player currently plays. The buying club pays a transfer fee to the selling club (i.e. buyout clause) and separately agrees to a salary with the player. There are no truly binding restrictions on transfer fees or salaries. In 2011, UEFA (the association that sets rules for European football) announced plans to gradually implement certain “Financial Fair Play” rules that could have indirectly affected transfer fees and salaries (e.g. auditing the fair market value of club sponsorship deals). But those rules were not immediately adopted and, in practice, football clubs had significant leeway to get the players they wanted. As an illustration, Paris Saint-Germain (PSG) broke the transfer fee record (€222 million) in 2017 when it hired Neymar, a Brazilian player, from FC Barcelona. For all intents and purposes, the market operates like any labor market in a corporate setting except that (1) one firm pays a fee to another firm when hiring a player away and (2) the transfers must take place during a designated transfer period (a window of a few weeks during the summer and winter).

The competitive structure and rules of European football (soccer) differ substantially from popular professional sports in the U.S. (e.g. baseball, basketball, American football, hockey), which have been the setting for several research studies in management. First, football clubs are not guaranteed to stay in the same league every season; they can be demoted to a lower league or promoted to a higher league based on their performance. Second, there is no “draft” in which clubs get to pick rookies who are entering the profession in a certain order based on past performance. Football clubs can hire players from any country at any stage of their career, except for minors (FIFA has implemented rules to prohibit child exploitation). Third, as already noted, football clubs face almost no rules regarding the overall wage bill or the maximum/minimum individual wage that can be offered to a player. Fourth, football clubs not only compete (for players and on the field) with clubs from their own leagues, but also compete with clubs from leagues in other countries, making the market truly global. American professional sports leagues face almost no competition from rival leagues. Finally, when a football player is transferred to a new team, the old contract is terminated. While in highly exceptional cases teams can trade contracts, virtually all transfers are different to those in the American sports, where players move with their existing contracts to the new team.

As a result, the labor market in football is economically significant and global. For instance, according to a FIFA report (FIFA 2019), in 2019 there were 4,162 football clubs involved in 18,042 international transfers affecting more than 15 thousand players from almost 180 different countries. In terms of value, transfers involving at least one European club generated close to USD 7 billion and accounted for 95% of the total value of transfer fees in 2019.

Appendix II: Data Collection Process for League Rules Regarding Immigrant Players

We created a hand-collected database documenting temporal changes in rules governing the acquisition and transfer of foreign players for each of the five leagues in our sample. As described in the methods section, we use changes in national caps on the number of immigrant players and in the countries subject to those caps to instrument the actual number of immigrant players hired by each club. To collect these data, we relied on several sources. We started by collecting information from league's websites on their current rules as of 2020. However, data for previous years was not available for most seasons. While some major changes to immigrant players rules are well documented, such as the Bosman ruling of 1996, most of the incremental amendments made by individual leagues are not documented by a single source. We thus manually collected the information from various sources for each of the five leagues in our sample by searching the main newspapers from each country. If we found inconsistencies across historical accounts, we contrasted different data sources. We also contacted several experts to resolve conflicting information. Based on the information we collected, we created a league-year dataset that records the number of immigrant players allowed in a squad during a season and on the field during a game (Table 1a), and the countries or regions exempted from immigration rules (Table 1b).

To illustrate our data gathering procedure, take the case of Spain's La Liga. In 1988, *El País*, Spain's main newspaper, reported that the national football assembly passed a rule that allowed clubs to have 3 immigrant players beginning in the 1988/89 season. In 1991, the same newspaper reported that clubs could employ 4 immigrant players by the 1991/92 season. Because major announcements regarding the rules were not available for all seasons, we also took advantage of articles describing clubs that breached foreign players rules. In 1994, for instance, the Spanish FA fined Real Madrid because they fielded four immigrant players in a match against SD Compostela. At that time, clubs could employ 4 immigrant players, but could only field 3 of them at the same time during a match. Jorge Valdano, Real Madrid's coach, mistakenly substituted a Spaniard, Luis Enrique, with Czech player Peter Dubovsky. During the last 10 minutes of the match, Real Madrid played with an Argentinian, a Danish, a Chilean, and a Czech player. As a result, Real Madrid was fined for violating the rules. Each league can implement different constraints on the number of immigrant players that a team can employ during a season and play during a match.

Additionally, leagues can implement different definitions of which countries of origin are subject to the foreign player cap. In some cases, these definitions directly follow from the country's more general immigration regulations. In other cases, the league defines "foreign" differently than immigration authorities. Two major agreements shape player migration in European football: the European Union (EU) and the Cotonou Agreement. First, players from EU member states were considered nonimmigrant players starting in the 1996/97 season, after the watershed Bosman case ruling. The ruling indicated that athletes born in any EU state should be allowed to work freely in any other EU state. Before 1996, none of the football leagues were required to exempt players from EU nations from the immigrant player quota. The EU further enlarged its list of member states in 2004, 2007, and 2013. Second, the Cotonou Agreement extended some of the EU's rules on freedom of labor mobility to 78 African, Caribbean, and Pacific states. Thus, Cotonou allows individuals from non-EU states to benefit from some of the immigration exemptions.

Leagues may also lift restrictions of their own accord or because of court rulings that deem it illegal to impose restrictions on individuals from certain countries. For instance, Bundesliga (Germany) does not impose limits on the number of players born in any of the UEFA countries. Another example is

La Liga (Spain), which in the early 2000s lifted restrictions for Russian players after a court ruled that Russian individuals had to be treated like individuals from EU member states.

There is a straightforward (but not always easy) way for a foreign-born player to overcome the cap imposed by a league: becoming a citizen of the focal league's country, after which they no longer count towards the foreign player cap. For example, Lionel Messi, born in Argentina, is a Spanish citizen so he was not counted as foreign when playing for FC Barcelona. However, players are subject to applicable immigration laws if they desire citizenship—there is no special path to citizenship for footballers. Typically, a player who is not exempt from the cap on foreigners must reside in the country for years before becoming a citizen.

These various considerations mean that the actual number of foreign-born players on a team can exceed the cap on “foreigners” defined by league rules. For instance, a club from Spain might field more than the maximum three “foreign” players allowed if some of the players were, say, naturalized citizens or born in the EU or from a Cotonou country. Thus, the league rules are not deterministic in predicting the number of foreign players on a team. But they do place important constraints that, on average, lead to a close correspondence between the actual vs. maximum foreign players allowed. Our instrumental variable is based on this logic.

Appendix III: Correlations for Player-Match Observations

	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9
1 Immigrant Player	0.41	0.49	1								
2 Starting Lineup	0.66	0.47	-0.022***	1							
3 Goals	0.08	0.3	0.038***	0.060***	1						
4 Pass Rate	0.76	0.16	0.055***	0.008***	0.012***	1					
5 Dribble Rate	0.27	0.39	0.046***	0.104***	0.076***	0.102***	1				
6 Touches	44.3	23.6	0.001	0.623***	0.027***	0.222***	0.211***	1			
7 Age	26.76	4.2	-0.014***	0.103***	-0.012***	-0.044***	-0.096***	0.063***	1		
8 Manager Foreign	0.24	0.43	0.111***	0.003*	0.018***	0.059***	0.021***	0.067***	-0.024***	1	
9 Market Value	11.83	2.64	0.185***	0.118***	0.111***	0.109***	0.094***	0.193***	-0.178***	0.166***	1

Notes: The table shows the mean, standard deviation and correlations of the main variables included in the analysis in Table 5 and Table 9. Because we only have event-data from WhoScored for the domestic leagues and seasons 2009/10-2018/19, we display the descriptive statistics for this subset of the database. Please note that the high collinearity among player's performance measures (i.e. variables 2-6) is expected, and these variables are never included in the same regression models.

Appendix IV: Is National Diversity Associated with Higher Club Performance?

	(1)	(2)	(3)	(4)	(5)	(6)
	Pr(win)	Pr(win)	Pr(win)	Pr(win)e	Pr(win)	Pr(win)
Count of unique birth countries	0.00733*** (0.00162)					
Shannon index of unique birth countries		0.0323*** (0.00660)				
Blau index of unique birth countries			0.0769*** (0.0159)			
Count of unique languages				0.00734*** (0.00195)		
Avg cultural dist between all players					0.00262** (0.00103)	
Avg cultural dist between dest country and each player						0.00629*** (0.00133)
Constant	0.339*** (0.00751)	0.337*** (0.00744)	0.331*** (0.00868)	0.346*** (0.00715)	0.357*** (0.00637)	0.346*** (0.00570)
Observations	111,685	111,685	111,685	111,685	111,644	111,671
R-squared	0.048	0.048	0.048	0.048	0.048	0.048
Season x League FE	YES	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES	YES

Notes: This table replicates Table 6 using a *win* indicator as a dependent variable. See the notes from Table 6 for an explanation of the sample and variables. *** p<0.01, ** p<0.05, * p<0.1

Appendix V: Is National Diversity Associated with Higher Club Performance After Controlling for Number of Immigrant Players?

	(1)	(2)	(3)	(4)	(5)	(6)
	Pr(win)	Pr(win)	Pr(win)	Pr(win)	Pr(win)	Pr(win)
Count of unique birth countries	-0.00650** (0.00309)					
Shannon index of unique birth countries		-0.0411** (0.0180)				
Blau index of unique birth countries			-0.0924** (0.0426)			
Count of unique languages				-0.00226 (0.00219)		
Avg cultural dist between all players					-0.00266* (0.00142)	
Avg cultural dist between dest country and each player						0.000546 (0.00196)
Number of immigrant players	0.0142*** (0.00303)	0.0181*** (0.00437)	0.0176*** (0.00438)	0.0108*** (0.00201)	0.0123*** (0.00226)	0.00915*** (0.00250)
Constant	0.342*** (0.00759)	0.341*** (0.00721)	0.347*** (0.00862)	0.335*** (0.00806)	0.336*** (0.00742)	0.331*** (0.00739)
Observations	111,685	111,685	111,685	111,685	111,644	111,671
R-squared	0.049	0.049	0.049	0.049	0.049	0.049
Season x League FE	YES	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES	YES

Notes: This table replicates Table 7 using a *win* indicator as a dependent variable. See the notes from Table 7 for an explanation of the sample and variables *** p<0.01, ** p<0.05, * p<0.1

Appendix VI: Immigrant Managers and Club Performance

	(1)	(2)	(3)	(4)	(5)
	Pr(win)	Pr(win)	Pr(win)	Pr(win)	Pr(win)
Immigrant manager	0.00290 (0.00762)	-0.00155 (0.00716)	-0.0446*** (0.0128)	-0.00174 (0.00721)	-0.0464*** (0.0155)
Number of Immigrant players on club		0.00977*** (0.00166)	0.00735*** (0.00180)	0.0143*** (0.00299)	0.0145*** (0.00298)
Immigrant manager x Number of Immigrant players			0.00887*** (0.00273)		
Number of Unique Countries of Birth				-0.00653** (0.00309)	-0.00899*** (0.00330)
Immigrant manager x Number of Unique Countries					0.00896*** (0.00330)
Constant	0.373*** (0.00192)	0.331*** (0.00771)	0.341*** (0.00782)	0.342*** (0.00784)	0.352*** (0.00838)
Observations	111,562	111,562	111,562	111,562	111,562
R-squared	0.048	0.049	0.049	0.049	0.049
Season x League FE	YES	YES	YES	YES	YES
Club FE	YES	YES	YES	YES	YES

Notes: This table replicates Table 8 using a *win* indicator as a dependent variable. See the notes from Table 8 for an explanation of the sample and variables. *** p<0.01, ** p<0.05, * p<0.1