The Effect of Gender Equality on International Soccer Performance*

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Abstract

In this paper, we propose a new estimation strategy that uses the variation in success between the male and the female national soccer team within a country to identify the causal impact of gender equality on women's soccer performance. In particular, we analyze whether within-country variations in labor force participation rates and life expectancies between the genders, which serve as measures for the country's gender equality, are able to explain differences in the international success of male and female national soccer teams. Our results reveal that differences in male and female labor force participation rates and life expectancies are able to explain the international soccer performance of female teams, but not that of male teams, suggesting that gender equality is an important driver of female sport success.

JEL-Classification: J16, L83, Z13
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1 Introduction

Major sporting events such as the Olympic Games and World Championships attract enormous attention and thereby affect both public sentiment and individual behavior. Amongst other things, national teams' results in international sport competitions affect economic perceptions and expectations (Dohmen *et al.*, 2006), the stock markets (see, e.g., Edmans *et al.*, 2007; Kaplanski and Levy, 2010), and the motivation of unemployed individuals to search for employment (Doerrenberg and Siegloch, 2014).[1] The success at these events is therefore a matter of national importance substantially supported by governments. In this regard, the performance of the national soccer team is of particular interest, as soccer is considered to be the most popular sport worldwide. About 270 million people, i.e., four percent of the world's population, are actively involved in soccer (FIFA, 2007a). The 2006 FIFA World Cup, for example, had a cumulative television audience of 26.29 billion and its final was watched by an audience of 715.1 million viewers, more than at any other single sporting event (FIFA, 2007b).[2] Due to its high popularity and its major importance for society, a growing body of literature is concerned with the determinants of international soccer success.

Starting with Hoffmann *et al.* (2002) and followed by Torgler (2004), Macmillan and Smith (2007), and Leeds and Leeds (2009), this research has shown that a country's wealth, its sports culture, and its climate have a significant impact on its performance in international soccer competitions. These results are similar to those of studies of the determinants of Olympic success (see, e.g., Bernard and Busse, 2004; Hoffmann *et al.*, 2004; Johnson and Ali, 2004; Trivedi and Zimmer, 2013).

In this paper, we explore a different aspect of international soccer performance: gender equality. The economic literature has provided evidence for a strong positive correlation between the degree of gender equality within society and a country's level of economic development (see, e.g., Doepke *et al.*, 2012; Duflo, 2012). However, it is ambiguous whether there exists indeed a causal pathway from female empowerment to development or whether other factors are accountable for this relationship. We contribute to this literature by providing evidence for a causal effect of gender equality on women's international soccer performance.

In both the soccer and the Olympics literature, empirical evidence on the determinants of women's success is still scarce. The few studies that do exist (see, Hoffmann *et al.* (2006), Torgler (2008), Matheson and Congdon-Hohman (2011), and Cho (2013) for soccer and Klein (2004), Leeds and Leeds (2012), Bredtmann *et al.* (2014), and Lowen *et al.* (2014) for the

[1]The impact of sports results in international competitions, however, even goes beyond purely economic effects. For instance, Carroll *et al.* (2002) show that the risk of admissions for heart attacks at English hospitals increased by 25 percent on the day of England's loss to Argentina in a penalty shoot-out in the 1998 World Cup. Furthermore, Berthier and Boulay (2003) document that mortality from heart attacks for French men was significantly reduced on the day France won the 1998 World Cup.

[2]The FIFA World Cup further plays a huge role in the social media. During the 2014 tournament, 672 million Tweets related to the World Cup were posted on Twitter. Of these Tweets, 35.6 million were sent only during the semi-final between Brazil and Germany – a new Twitter record for a single event (Rogers, 2014).

Olympic Games) generally rely on the analysis of correlations between female specific factors and women's sports performance. While this earlier research provides convincing evidence that female success in sports is associated with their economic opportunities and their political rights, our paper represents the first attempt to identify a causal effect of women's role in society on their success in international soccer competitions.

To address this question, we propose an estimation strategy that uses the variation in success between the female and the male national soccer team within each country, i.e., the intra-country heterogeneity in success, to identify the causal impact of socioeconomic and cultural factors on a country's soccer performance. Since we suspect gender equality to be the prime reason for differences in the success of male and female soccer teams, we are particularly interested in the effect of men's and women's labor force participation and their life expectancy on the countries' international soccer performance, which serve as proxies for differences in the economic opportunities and social integration of men and women.

Our results reveal that the effect of gender equality on international soccer success differs largely between male and female soccer teams. While within-country variation in labor force participation rates and life expectancies between the genders are able to explain variation in the international soccer performance of female teams, they have no explanatory power for the success of male teams. This suggests that gender equality is an important driver of female sport success.

The remainder of the paper is as follows. Section 2 presents the data used in the empirical analysis and provides descriptive statistics on the soccer performance of male and female national teams. In Section 3, we outline our empirical strategy, while estimation results are presented and discussed in Section 4. Section 5 concludes.

2 Data and Descriptive Statistics

Our analysis is based on the FIFA World Ranking, a ranking system that reflects the current comparative strength of men's and women's national teams in association football. Since December 1992, the International Federation of Association Football (FIFA) awards points to the member nations' male teams based on the results of their international matches played against other national teams. These points are used to calculate the ranking, with the most successful team being given a rank of one. In 2003, FIFA launched the FIFA World Ranking for women's national teams.[3]

In our analysis of the international success of male and female soccer teams, we use this ranking to construct our outcome measure, which captures the strength of a nation's male and female soccer team, respectively. Using this point system creates two problems that have

[3]See *www.fifa.com/worldranking* for further information on the FIFA World Ranking as well as Leeds and Leeds (2009) for a more extensive description of the calculation of this ranking.

to be tackled. First, the distribution of points varies between men and women and second, the number of men's national teams exceeds that of women's teams. In order to address these issues, we limit the sample to nations that compete with both male and female teams in international soccer competitions for any year between 2003 and 2012. While our restricted sample might be a selective sample of all countries, this selectivity does, if anything, result in an underestimation of the true effect of gender equality on international soccer performance, as those countries exhibiting the highest gender inequality, i.e., countries in which women do not engage in soccer (and probably in other sports) at all, have been excluded. For this sample, we construct new male and female rankings based on the teams' FIFA points for any given year. In order to facilitate the interpretation of the regression results, this new ranking is constructed in reversed order to the original FIFA ranking, i.e., the highest ranking position is assigned to the best performing team and the 1^{st} ranking position is assigned to the worst performing team. The resulting variable *Rank* serves as the dependent variable in all our analyses.[4]

Figure 1 displays the countries' international soccer performance as measured by *Rank* for both male and female national teams. The solid line at an angle of 45° indicates a perfect correlation of men's and women's ranking, meaning that both teams perform equally well in international soccer. Countries in which the female national team is better ranked than the male national team are located above the line and countries in which the male team outperforms the female team are located below the line. For example, Canada (CAN) is located above the line, indicating that Canada's female national team is better ranked (128th) than its male team (66th). Figure 1 reveals that only a few countries are located around the 45°-line, whereas in most countries, there are large differences in the success of male and female national soccer teams. This suggests that there must exist some country-specific conditions that differently affect the international soccer performance of men and women.

In our analysis of the international soccer performance of men and women, we control for a selection of socioeconomic variables, which have either been established as important determinants of success in the previous literature or are meant to control for factors specific to female or male success, respectively. Among the general indicators are *ln GDP* and *ln Population*, the natural logarithms of GDP per capita income and population, which measure a country's wealth and its population size, respectively. While the population size contributes to the size of the talent pool, GDP influences its development, i.e., wealthier countries have more resources to spend on health care, training facilities, and other productivity enhancing inputs. Both factors, the size and the development of talent pools, are mandatory for international soccer performance. We further take into account the effect of climate by including an indicator variable *Tropics*, which takes value one if more than 50 percent of a country's population live in tropical or subtropical climate zones, and zero otherwise. As Sachs (2001) points out, countries that are subject to a tropical climate are suffering from a high burden of tropical diseases, which

[4]While FIFA points are available on a monthly basis, we aggregate the monthly scores to average yearly scores in our analysis.

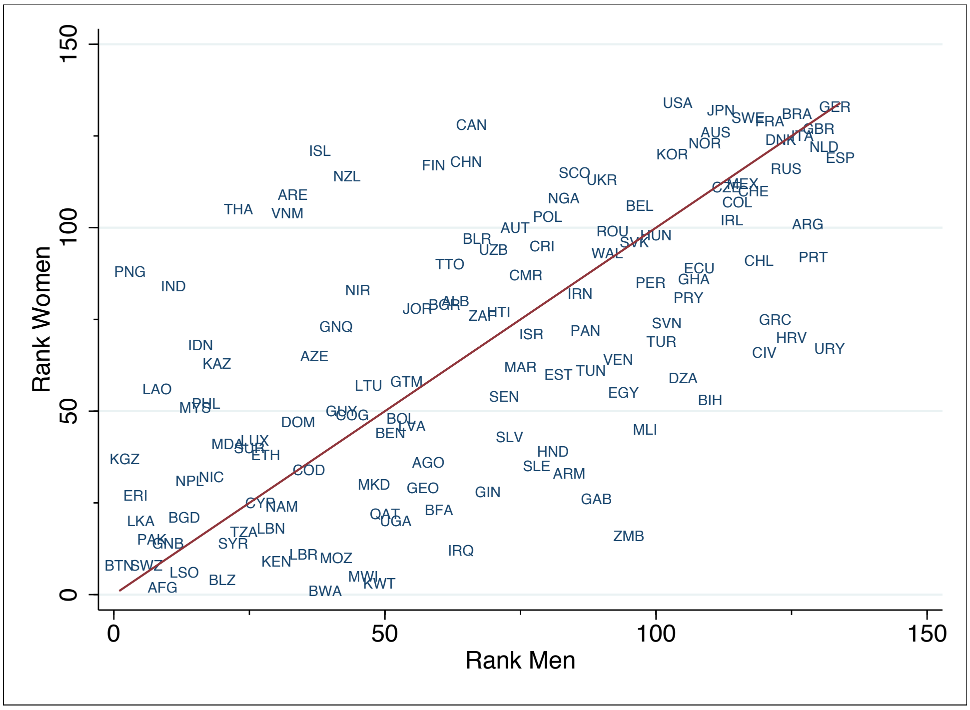

Figure 1: Ranking of National Soccer Teams by Gender in 2012

negatively affects a wide range of factors, including economic growth and human capital. While the above-named country-specific conditions are assumed to affect both men and women, we further control for gender-specific conditions of the country. In particular, we search for variables that capture the degree of gender equality in a society and are therefore able to explain the differing success of male and female soccer teams within a given country. We expect that countries with a low level of gender equality, i.e., societies in which women are disadvantaged or discriminated against, offer worse training facilities and less talent scouting and development for women compared to men. This does not only apply to particular traditional and conservative societies existing in many developing countries as, e.g., in the Middle East and North Africa, but even in the modern Western societies significant differences in the amount of sport sponsorship for men and women exist. This gender-specific inequality is expected to lead to an underperformance of female athletes relative to male athletes within a given country.

Our first variable of interest is the countries' gender-specific labor force participation rate, *LFPR*, which approximates the economic opportunities of the population, which in turn positively affect participation in leisure activities such as competitive sports. A high difference in male and female labor force participation rates suggests that women and men do not have the same opportunities in the labor market and thus reflects a low degree of gender equality. A second potential measure of equality in the population is the gender-specific *Life expectancy* at birth, which does not only capture the overall burden of disease of a population and the quality of the health care system, but also the relative access of genders to it. Both *LFPR* and *Life expectancy* measure the degree of emancipation and equality in society and should thus capture the same variation in the soccer success of men and women. Therefore, the two variables are not included in a single regression, but separate regressions are estimated for both variables to ensure identification of the gender equality effect.

Figure 2 displays the relationship between the *Rank* of the countries' male and female soccer teams and their gender-specific labor force participation rates and life expectancies, respectively. For female teams, both measures of gender equality are strongly positively correlated with their soccer ranking. For male teams, in contrast, the finding is mixed: While there exists a slight positive relationship between men's life expectancy and their soccer ranking, no such relationship or even a slight negative correlation is found between their labor force participation rate and their ranking. This provides some first indication that *LFPR* and *Life expectancy* might contribute to the international soccer performance of female teams, but not of male teams.

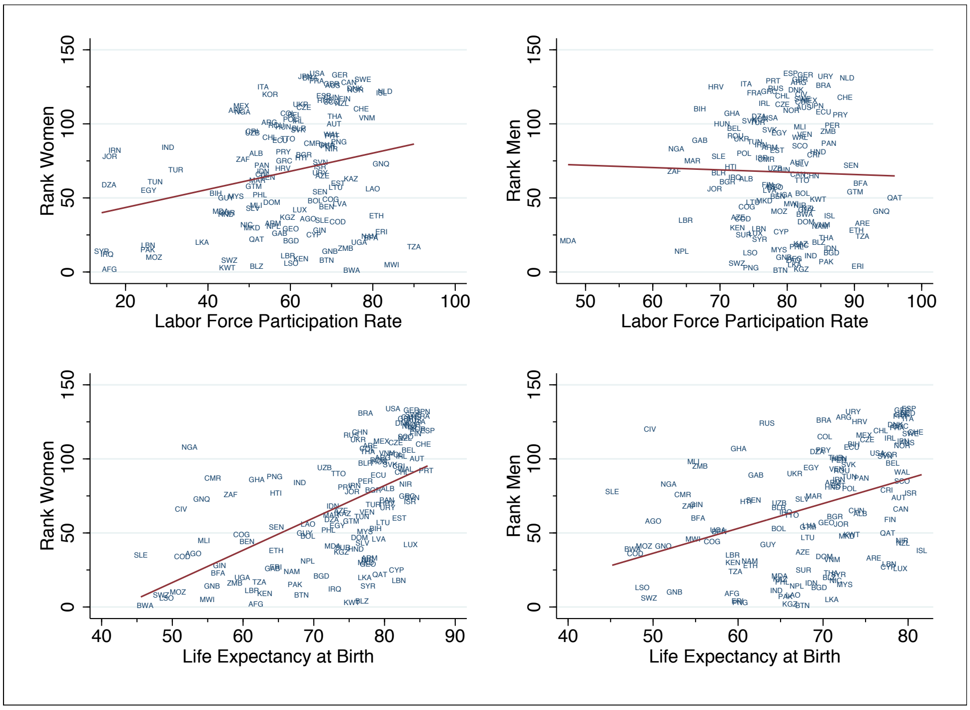

Figure 2: Relationship between Women's and Men's Ranking and LFPR and Life Expectancy in 2012

The final data set contains 2,300 observations, equally divided into male and female teams, of 135 countries covering the years 2003 to 2012. Descriptive statistics of all variables included in our analysis, separately for the male and the female sample, are displayed in Table 1.[5] As expected, the statistics show that, on average, men's LFPR is significantly higher and their life expectancy is significantly lower than those of women's. A detailed description of the variables and their data sources can be found in Table A1.

[5]While it is possible to control for additional country-specific indicators partly referred to in the literature, including further variables leads to the problem of multicollinearity between the explanatory variables and hinders the identification of fundamental underlying processes in the analysis. Therefore, we limited the regressors to those variables mentioned above, which represent a selection of variables controlling for a large variety of different sources of international sports success.

3 Empirical Strategy

Our empirical analysis is divided into two steps. In the first step, *Rank* is regressed on the set of socioeconomic variables described above to analyze the correlates of international soccer success separately for male and female soccer teams. Such an approach is standard in the literature and serves as a preliminary analysis for the main estimations of the causal impact of gender equality on international soccer performance that are carried out in the second step. Let the indices i denote the team and t the year, then the baseline regression is given by

$$\begin{aligned}\text{Rank}_{it} = \alpha_0 + \alpha_1 \ln \text{GDP}_{it} + \alpha_2 \ln \text{Population}_{it} + \alpha_3 \text{Tropics}_i \\ + \alpha_4 \text{Gender equality}_{it} + \epsilon_{it} \,,\end{aligned} \tag{1}$$

where *Gender equality* represents our proxies for gender equality, the gender-specific labor force participation rate and life expectancy, respectively. Since national success is influenced by a wide range of factors and there is a large amount of inter- and intra-country heterogeneity, it is impossible to capture all relevant factors in the regressions. To address the problem of unobserved heterogeneity, time fixed effects, country fixed effects, and a combination of both are sequentially added to the regressions.

In the second step, the observations for women and men are pooled and an indicator variable, *Female*, is introduced to mark observations of women's teams. Since it is suspected that the effects of our proxies for gender equality on success differ between men and women, *Gender equality* is further interacted with the *Female* dummy. The baseline regression in the second step is given by

$$\begin{aligned}\text{Rank}_{ijt} = \beta_0 + \beta_1 \ln \text{GDP}_{it} + \beta_2 \ln \text{Population}_{it} + \beta_3 \text{Tropics}_i + \beta_4 \text{Female}_{ijt} \\ + \beta_5 \text{Gender equality}_{ijt} + \beta_6 \text{Female}_{ijt} \times \text{Gender equality}_{ijt} + \upsilon_{ijt} \,,\end{aligned} \tag{2}$$

where the index j denotes the gender and $\text{Female}_{ijt} \times \text{Gender equality}_{ijt}$ is the interaction of *Female* and *Gender equality*. Again, time fixed effects, country fixed effects, and a combination of both are sequentially added to the regressions.

As a final specification in the second step, the following regression is estimated

$$\begin{aligned}\text{Rank}_{ijt} = \gamma_0 + \gamma_1 \text{Female}_{ijt} + \gamma_2 \text{Gender equality}_{ijt} \\ + \gamma_3 \text{Female}_{ijt} \times \text{Gender equality}_{ijt} + \phi_{it} + \zeta_{ijt} \,,\end{aligned} \tag{3}$$

where ϕ_{it} represents a country-year fixed effect, which captures all variation in the ranking between countries and over time, i.e., we net out every country-year specific effect. All variables included in our final specification therefore have to vary by gender, such that the effect of gender equality on soccer performance is solely identified through variation in *Rank* and *LFPR* and

Life expectancy, respectively, between the male and the female soccer team within each country at a given point of time. Using this identification strategy enables us to control for any non-gender-specific heterogeneity in the countries' soccer performance. As such, $\widehat{\gamma_3}$ gives us a causal estimate of the effect of gender equality on a country's international soccer performance.

4 Results

The results of the single regressions for male and female soccer teams (Eq. (1)) including the gender-specific labor force participation rate and life expectancy as our proxy for gender equality, respectively, are shown in Tables 2 and 3. In both cases, the first three columns show the results for women and the last three those for men. In each case, Column I includes no fixed effects whatsoever, Column II includes year fixed effects, and Column III contains both year and country fixed effects.

The results of our first model, excluding country and time fixed effects, reveal that the international success of both male and female soccer teams increases with their country's population size and wealth, i.e., an increase in both variables improves a country's ranking position, which is in line with the findings of previous literature (see, e.g., Hoffmann *et al.*, 2006; Leeds and Leeds, 2009). The country's climate, however, does not affect the soccer performance of men and women. With respect to our variables of main interest, the gender-specific labor force participation rates and life expectancies, we find large differences between male and female soccer teams. While women's soccer performance significantly increases with both the country's female labor force participation rate and women's life expectancy, no effects of these gender equality proxies are found for men. This is a first indicator that gender equality is an important determinant of women's soccer success but not of men's.

While the results are robust to the inclusion of time fixed effects (Columns II), they alter substantially when country fixed effects are added to the regressions (Columns III). As the country fixed effects capture all inter-country heterogeneity previously explained by GDP, population, and our gender equality proxies, these variables have hardly any explanatory power once inter-country heterogeneity is accounted for. An exception is the countries' population size, which now tends to negatively affect international soccer success, especially of men. While this result seems counter-intuitive at first sight, it can be explained by the fact that those countries that show the highest population growth rates, such as many African, South Asian, and South East Asian countries, are not among the traditional soccer nations, which are mainly found in Europe and South America. Overall, these results suggest that it is rather economic and cultural differences between countries than the current economic condition within a country that are able to explain variation in international soccer performance.

In order to gain deeper insight into the impact of gender equality on international soccer performance, we estimate pooled regressions containing both male and female soccer teams as represented in Eqs. (2) and (3). The results of these models including gender-specific *LFPR* and *Life expectancy* as our gender equality proxies are shown in Tables 4 and 5, respectively. Again, Column I excludes both country and year fixed effects, Column II includes year fixed effects, and Column III includes both country and year fixed effects. Finally, Column IV represents the results of the model that contains country-year fixed effects. Overall, the results displayed in Columns I to III seem similar to those of the separate regressions for male and female teams. The country's GDP per capita and its population size are positively affecting international soccer performance as long as inter-country heterogeneity is not controlled for, while *Tropics* is uncorrelated with the countries' success in international soccer.

The results further show that the *Female* dummy is negative and significant in all specifications, suggesting that female teams are worse ranked than male teams on average.[6] Regarding our coefficients of main interest, the effect of *LFPR* (*Life expectancy*) and its interaction with the *Female* dummy, an interesting result appears. The coefficient of *LFPR* is negative through all specifications, suggesting that for the reference group of male soccer teams, the country's *LFPR* is negatively correlated with the soccer performance of these teams. The size and significance of this effect, however, diminishes once inter-country heterogeneity is accounted for (Columns III and IV). The interaction of the *Female* dummy and *LFPR*, in contrast, is positive and statistically significant through all specifications, revealing that there is a significant difference in the effect of *LFPR* on male and female teams. This result even holds when country-year fixed effects are added to the regression (Column IV) and the effect of *LFPR* on countries' success is solely identified through variation in success and *LFPR* between male and female teams within a country at a given point of time. This suggests that within-country variation in male and female labor force participation rates, which approximates for women's economic opportunities in society, have significantly more explanatory power for women's international soccer performance than for men's.

Based on these regression result, we further calculate the overall effect of our gender equality measure on the soccer performance of women. For the model including country-year fixed effects, the effect of *LFPR* on women's ranking amounts to 0.374 with a standard error of 0.172 (p-value = 0.03). In terms of magnitude, this effect is sizeable. A one standard deviation increase in *LFPR*, which is roughly equal to the difference in the LFPR between Argentina (54.9%) and the United Kingdom (70.0%) in 2012, improves the ranking by about 6 positions. This finding suggests that there is a positive and sizeable effect of a country's female labor force participation rate on the international soccer performance of female teams, but no comparable effect for male teams.

The results for our second gender equality measure, life expectancy at birth, are similar

[6] As we calculated a new ranking based only on those countries that participate with both male and female soccer teams in any given year, there is actually no difference in the average rank of male and female teams in our sample. As the *Female* dummy is interacted with *LFPR* and *Life expectancy*, respectively, the coefficient of this dummy gives us the difference in ranks between female and male teams at a hypothetical point of *LFPR* = 0 (*Life expectancy* = 0).

to those of *LFPR*. For male teams, *Life expectancy* is uncorrelated with their international soccer performance. The interaction of *Life expectancy* with the *Female* dummy, in contrast, is positive and highly statistically significant in all specifications, again suggesting that our gender equality proxy has a diverse effect on the international soccer performance of male and female teams. The overall effect of *Life expectancy* on the soccer performance of women in our preferred model, including country-year fixed effects, amounts to 1.372 with a standard error of 0.799 (p-value = 0.08). In terms of magnitude, this implies that a one standard deviation increase in *Life expectancy*, which is roughly equal to the difference in the life expectancy between Indonesia (72.7 years) and Canada (83.4 years) in 2012, improves the ranking by about 14.3 positions. Hence, there exists a positive and sizeable impact of women's life expectancy on their international soccer performance, but no such an effect for men.

5 Conclusion

In this paper, we analyze the effect of gender equality on the international soccer performance of male and female national soccer teams. Given that soccer is played at a professional level all over the world and has the highest global television audience in sport (FIFA, 2007b), a large and growing body of literature is concerned with the determinants of international soccer success.

While some authors have analyzed the determinants of soccer performance in general (e.g., Hoffmann *et al.*, 2002; Leeds and Leeds, 2009), others have been specifically interested in the influencing factors of women's success (e.g., Torgler, 2008; Cho, 2013). While the latter studies have shown that the international success of female soccer teams is positively correlated with women's economic opportunities and political rights in their country, they provide no evidence on the causal impact of gender equality on the international soccer performance of women.

In this paper, we propose a new estimation strategy that uses the variation in success between the male and the female national soccer team within each country to identify the causal impact of gender equality on women's soccer performance. In particular, we are interested in whether within-country variations in labor force participation rates and life expectancies between the genders, which serve as measures for the country's gender equality, are able to explain differences in the international soccer performance of the male and female national team within a given country.

In accordance with previous literature on international soccer performance, we find the country's GDP per capita and its population size to be positively associated with women's and men's international soccer performance. These effects diminish, however, once inter-country heterogeneity is accounted for. With respect to our measures of gender equality, the results differ largely between male and female soccer teams.

In separate regressions for male and female soccer teams, we find the gender-specific labor force participation rate and the life expectancy at birth to be positively correlated with women's international soccer performance, but uncorrelated with men's. This is a first indicator of the differential importance of gender equality for men's and women's soccer success. More importantly, the results of our fixed effects estimation, which solely uses variation between male and female national teams within a given country at a given point of time to identify the effect of gender equality on international soccer performance, support this result. The fixed effects estimates reveal that differences in male and female labor force participation rates and life expectancies are able to explain the international soccer performance of female teams, but not of male teams. This suggests that gender equality is an important driver of female success – presumably not only in sports, but also in other fields of society.

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Tables

Table 1: Descriptive Statistics

	Women		Men	
	Mean	StdD	Mean	StdD
FIFA points	$1,425.693$	331.238	540.559	294.027
Rank	58.826	34.535	58.809	34.546
ln GDP	9.033	1.230	9.033	1.230
ln Population	16.417	1.576	16.417	1.576
Tropics	0.329	0.470	0.329	0.470
LFPR	59.470	14.769	78.875	6.948
Life expectancy	72.731	10.706	67.678	9.405
Observations	1,150		1,150	

Notes: – Values are based on the pooled sample over all years. – The slight difference in the average rank of male and female teams is due to the possibility that two teams achieve the same number of points in a given year and are thus given the same rank in the respective year, leading the distribution of the rank of the male and the female national teams to slightly diverge from each other. – The difference of means in LFPR and Life expectancy between women and men is statistically significant at the 0.1% level.

Table 2: Gender-Specific Regressions – LFPR

	Women			Men		
	I	II	III	I	II	III
ln GDP	17.552†	17.235†	−8.177*	12.464†	12.143†	−3.044
	(1.783)	(1.806)	(4.453)	(2.035)	(2.064)	(8.396)
ln Population	9.850†	9.926†	−28.105*	7.021†	7.091†	−49.283**
	(1.185)	(1.200)	(16.875)	(1.632)	(1.641)	(22.290)
Tropics	−0.554	−1.299	–	−6.581	−7.345	–
	(4.522)	(4.574)		(6.368)	(6.424)	
LFPR	0.442†	0.450†	−0.103	−0.456	−0.455	0.396
	(0.127)	(0.129)	(0.272)	(0.282)	(0.288)	(0.435)
Constant	−287.549†	−296.729†	577.348**	−130.922***	−140.288†	843.687**
	(26.257)	(25.871)	(270.398)	(39.224)	(39.486)	(357.602)
Year FE	no	yes	yes	no	yes	yes
Country FE	no	no	yes	no	no	yes
Adjusted R^2	0.588	0.620	0.796	0.318	0.348	0.466
Observations	1,150	1,150	1,150	1,150	1,150	1,150

Notes: – Significant at: †0.1% level; ***1% level; **5% level; *10% level. – Robust standard errors (clustered at the country level) are reported in parentheses. – The dependent variable Rank is defined such that higher values are assigned to the best performing teams.

Table 3: Gender-Specific Regressions – Life Expectancy

	Women			Men		
	I	II	III	I	II	III
ln GDP	14.497†	14.088†	−6.963	12.266†	12.134†	−2.543
	(2.624)	(2.620)	(4.304)	(2.603)	(2.682)	(8.527)
ln Population	9.076†	9.135†	−20.744	6.837†	6.932†	−49.023**
	(1.295)	(1.310)	(17.995)	(1.686)	(1.693)	(22.656)
Tropics	0.421	−0.293	–	−8.353	−9.145	–
	(4.564)	(4.584)		(6.305)	(6.373)	
Life expectancy	0.558**	0.574**	−0.924	−0.063	−0.095	−0.032
	(0.275)	(0.272)	(0.699)	(0.365)	(0.371)	(0.592)
Constant	−261.883†	−271.225†	506.160*	−157.239†	−166.482†	868.357**
	(26.459)	(25.920)	(277.442)	(35.824)	(35.979)	(363.494)
Year FE	no	yes	yes	no	yes	yes
Country FE	no	no	yes	no	no	yes
Adjusted R^2	0.565	0.595	0.799	0.310	0.341	0.465
Observations	1,150	1,150	1,150	1,150	1,150	1,150

Notes: – Significant at: †0.1% level; ***1% level; **5% level; *10% level. – Robust standard errors (clustered at the country level) are reported in parentheses. – The dependent variable Rank is defined such that higher values are assigned to the best performing teams.

Table 4: Pooled Regressions – LFPR

	I	II	III	IV
ln GDP	15.063†	14.744†	−4.138	–
	(1.560)	(1.579)	(4.832)	
ln Population	8.462†	8.535†	−38.597***	–
	(1.177)	(1.186)	(14.306)	
Tropics	−3.390	−4.145	–	–
	(4.658)	(4.695)		
Female	−70.167***	−70.555***	−42.166*	−42.519*
	(22.214)	(22.538)	(22.820)	(23.237)
LFPR	−0.552*	−0.551*	−0.249	−0.257
	(0.279)	(0.283)	(0.302)	(0.312)
Female x LFPR	1.000***	1.007***	0.628**	0.631**
	(0.302)	(0.306)	(0.309)	(0.313)
Constant	−171.563†	−180.632†	728.491***	79.102***
	(32.291)	(32.404)	(231.812)	(24.252)
Year FE	no	yes	yes	no
Country FE	no	no	yes	no
Country-year FE	no	no	no	yes
Adjusted R^2	0.445	0.478	0.321	0.047
Observations	2,300	2,300	2,300	2,300

*Notes: – Significant at: † 0.1% level; *** 1% level; ** 5% level; * 10% level. – Robust standard errors (clustered at the country level) are reported in parentheses. – The dependent variable Rank is defined such that higher values are assigned to the best performing teams.*

Table 5: Pooled Regressions – Life Expectancy

	I	II	III	IV
ln GDP	13.399†	13.124†	−5.543	–
	(2.125)	(2.155)	(4.889)	
ln Population	7.959†	8.035†	−43.501***	–
	(1.242)	(1.251)	(15.435)	
Tropics	−3.967	−4.721	–	–
	(4.682)	(4.716)		
Female	−47.979†	−49.197†	−46.870***	−45.358***
	(13.679)	(13.698)	(14.262)	(14.443)
Life expectancy	−0.089	−0.105	0.407	0.804
	(0.320)	(0.321)	(0.768)	(0.940)
Female x Life expectancy	0.666***	0.684†	0.616***	0.568**
	(0.202)	(0.202)	(0.228)	(0.240)
Constant	−185.537†	−194.242†	774.645***	4.372
	(27.720)	(27.583)	(238.917)	(63.431)
Year FE	no	yes	yes	no
Country FE	no	no	yes	no
Country-year FE	no	no	no	yes
Adjusted R^2	0.433	0.466	0.331	0.067
Observations	2,300	2,300	2,300	2,300

*Notes: – Significant at: † 0.1% level; *** 1% level; ** 5% level; * 10% level. – Robust standard errors (clustered at the country level) are reported in parentheses. – The dependent variable Rank is defined such that higher values are assigned to the best performing teams.*

Appendix

Table A1: Data Sources and Definition of Variables

Variable	Source	Description
FIFA points	FIFA	Points awarded to male and female national teams based on the results of their international matches to calculate the FIFA World Ranking.
Rank	FIFA	New ordered ranking restricted to nations that compete with both male and female teams in international soccer competitions in a given year. To facilitate the interpretation of the regression results, the ranking is constructed in reversed order to the original FIFA World Ranking, i.e., the highest ranking position is assigned to the best performing team and the 1^{st} ranking position is assigned to the worst performing team.
ln GDP	Worldbank	Logarithm of GDP per capita (PPP, current international $).
ln Population	Worldbank	Logarithm of a country's population.
Tropics	CEPII	Data derived from the GeoDist dataset. The indicator variable marks countries with 50% or more of the population living in a region with tropical or subtropical climate.
LFPR	Worldbank	Labor force participation rate of the population above 15 meeting the economically active part of the population according to the definition of the International Labour Organization. This variable is gender-specific.
Life expectancy	Worldbank	Life expectancy at birth in years. This variable is gender-specific.