

Article

Critical Masses and Gender Diversity in Voluntary Sport Leadership: The Role of Economic and Social State-Level Factors

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Abstract: Gender equality in leadership positions is important for sport organizations to achieve economic and social sustainability. Based on a multi-level framework, this study examines spillover effects from economic and social state-level factors in sport organizations' environment on critical masses of women on their boards (in terms of share and numbers) and board gender diversity (reflected by different types of boards). Data of national and regional sport governing bodies in Germany were collected ($n = 930$), with variables capturing organizational characteristics (e.g., board composition) and economic and social factors at the state level. The results of regression analyses show that women's attainment in tertiary education increases the likelihood of a critical mass of at least 30% women on the board, and a higher divorce rate increases the likelihood of a critical mass of three women on the board. Sport organizations in states with a higher gender wage gap are more likely to have balanced boards, indicating that volunteering might be a substitute to paid work. The findings suggest that the presence of women in sport leadership is affected by economic and social conditions in the organizations' geographical surroundings and that spillover effects occur from the state level to the organizational level.

Keywords: leisure-time sports; critical mass; board gender diversity; sport governance; multi-level model; macro-economic factors



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1. Introduction

Gender equality is one of the 17 sustainable development goals of the United Nations (UN), and one main target is to “ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life” [1]. Therefore, it is important to understand the factors that influence or determine women’s presence in leadership positions. Education, business experiences, and a multi-faceted skill set are essential to reach leadership positions [2,3]. Women are better educated than men, since they are more often enrolled in higher education. Nevertheless, only 52.6% of women participate in the labor market [4], and women are still underrepresented in leadership positions in politics, economics, and social life [5]. In politics, only one quarter of all parliamentarians worldwide are women [6]. In economics, only 6.4% of the Fortune 500 CEOs are women [7]. In social life, leisure activities such as sports are also linked to unequal gender representation among leadership positions. For example, women make up only 19.7% and 13.3% of all board members in national sport organizations and international sport federations, respectively [8,9]. At the beginning of 2020, the International Olympic Committee (IOC) started a partnership with UN Women Sports to push the UN Women Sports for Generation Equality Initiative [10]. Thus, decision-makers in the sports sector seem to have recognized that gender equality is a central part of a sustainable and modern organizational structure.

The equal participation of women in all parts of living, including leadership in politics, economics, and leisure activities, is not only important in terms of social sustainability. Indeed, the presence of women on boards is also desirable in terms of economic sustainability. Several studies in the corporate sector as well as in the voluntary leisure sports sector have reported beneficial economic effects of a gender-diverse board. In the corporate sector, a higher share of women board members was found to increase firm value [11], while decreasing the likelihood of financial misconduct such as fraud [12]. A closer look reveals that not only the presence of both women and men, i.e., gender diversity, is important to achieve economic benefits, but that a “critical mass” of women is required to achieve economic benefits [13]. A critical mass in terms of a share of 30% women was found to increase firm performance, while a critical number of three women increased firm innovation [14]. In the leisure sports sector, only a few studies have investigated the impact of board gender diversity or critical masses of women on economic sustainability. Sport organizations with a critical mass of three women on the board were found to have fewer financial problems [15] and generate higher revenues [16].

To benefit from these advantageous outcomes and to achieve economic and social sustainability, it is necessary to investigate the factors influencing the presence of critical masses of women on the board and the level of board gender diversity. Individual characteristics such as educational degree or previous work experiences are not sufficient to explain the low shares of women in the labor market and on (sport) boards. Therefore, Cunningham [17] suggested considering the environmental surroundings of the sport organization, which encompass economic and social factors at the higher (state) level. So-called spillover effects from the macro-economic and macro-social environment to the organizational level and thus to the gender composition of boards have already been investigated in the corporate sector, e.g., in [18,19], but not for sport boards. Furthermore, those studies consider only national-level factors, not the specific living conditions of women within federal states. The economic situation, i.e., education opportunities or access to the labor market, as well as the social situation, i.e., living conditions and family responsibilities, might influence women’s potential to reach the boardroom [20].

The purpose of this study is to investigate potential spillover effects from economic and social state-level factors to the achievement of critical masses and gender diversity on the boards of sport governing bodies. The main research question is as follows: How do economic and social state-level factors affect the achievement of critical masses of women and gender diversity on the boards of sport governing bodies? A multi-level framework [21] is applied that accounts for the inherent nested structure, meaning that sport organizations are nested within federal states. The context of the study is sport governing bodies in Germany, including national and regional sport federations and associations. These organizations have their headquarters in the 16 federal states. The research question is answered using secondary data at the state level and at the organizational level, including information about several economic and social factors of the state where organizations have their headquarters and board characteristics of the sport governing bodies. The findings of the study may help politicians and sport policy makers to understand the significance of living conditions in the environment for the composition of organizations’ boards that are embedded in the same state.

2. Theoretical Framework and Literature Review

2.1. Gender Diversity and Critical Mass Theory

This study draws on two concepts regarding board composition: critical masses and gender diversity. The concept of board gender diversity is based on Kanter’s [22] work about gender ratios within groups. Generally, gender diversity is a continuum from 0 to 100% and aims at the presence of both women and men [22]. A *gender-balanced board*, i.e., with a share of ≥ 40 and $< 60\%$ women (or men), is the most preferred combination. However, Kanter [22] designated three other types of groups whose composition does not correspond to the ideal of a balanced group. Transferred to the board case, *uniform male*

boards do not include any women, while *skewed boards* are made up of less than 20% women. *Tilted boards* include $\geq 20\%$ but $< 40\%$ women. While women do not have a voice in uniform male boards, they may have concerns about raising their voice in male-dominated, skewed boards. Additionally, women may be overlooked or ignored in those boards. In contrast, women can add value to the work of the group if the board is tilted or balanced [22].

Based on the composition of groups such as boards [22] and the increased influence of women in tilted and balanced boards, critical mass theory [14,22] proposes that women are only able to participate in decision-making processes and influence the structure and culture of sport governing bodies when their subgroup in the boardroom achieves a specific size. This size is called a critical mass and can be determined by a share [13,22] or a number [14]. If this critical mass does not exist, women face the risk of being pressed into stereotypical roles and being seen as a representative of their group, not as individuals who can add substantial contribution to the work of the board [22].

Initially, the relative critical mass was reflected by a share of about 35% of the subgroup [22], resulting in evidence for a critical mass of 30% women on the board from corporate studies [23,24]. The consideration of a critical number of women in studies about the composition of boards was derived empirically: at least three people were found to convince a person to adopt an opinion [25]. The critical number was then transferred to the situation of women on corporate boards [13,26].

The gender composition of boards in terms of a critical mass of women and the level of board gender diversity were found to be related to board performance and organizational outcomes, respectively. Starting with studies on board gender diversity and critical masses from the corporate sector, organizations with tilted boards were found to perform better than those with skewed boards, and organizations with boards consisting of a critical mass of at least 30% or at least three women performed better than their counterparts with uniform male boards [13]. Additionally, firms with balanced boards outperformed firms with all other types of boards [27] and had higher earnings quality [24]. Furthermore, a critical mass of at least 30% or at least three women allowed women to act as full-fledged board members [28] and change the overall board culture [26]. A critical mass of at least 30% or at least three women was found to increase the board meeting quality [29], the level of firm innovation [30], and the financial performance of the firm [27] and facilitate the achievement of corporate sustainability goals [31].

In the sports sector, Adriaanse [8] investigated national sport federations of 45 countries and found that only one country has on average a balanced board, while 22 countries have skewed boards. In Germany, community sport organizations with uniform male boards were found to have more human resource problems than those with a skewed, tilted, or balanced board. Furthermore, organizations with balanced boards experienced fewer financial problems than uniform male boards [15]. In line with existing research in the corporate sector, critical masses on sport boards were found to influence decision-making processes [32] and reduce human resource problems [15]. Finally, critical mass measures have been used to investigate the board composition of Canadian sport boards [16] and sport boards in the United States [33].

2.2. Multi-Level Perspective and Spillover Effects

Based on the social-ecological model [21], a multi-level perspective is adopted in this study. This model was originally developed to study children's behavior, recognizing that their behavior is influenced by factors in their surroundings [21]. In the present study, this model is used to conceptualize how board gender composition at the organizational level (sport governing body) is affected by the economic and social environment in the federal state where the sport governing body is located. Such a multi-level model is an appropriate framework to examine potential spillover effects from economic and social state-level factors to critical masses and gender diversity on sport boards for two reasons: First, sport governing bodies are multi-level entities and open systems [34], which "interact with and are influenced by their external environment" [17] (p. 76). Second, the composition of a

sport board is not an independent and internal decision but is affected by various factors at three levels, namely micro, meso, and macro levels [17]. Those levels intersect and interact dynamically [35]. In sport gender research, scholars have used a multi-level model to investigate barriers to gender diversity in leadership positions (e.g., [36–39]), gender differences in occupational turnover in coaching positions [40], as well as barriers for female coaches [35].

Within a multi-level model, higher levels can have different effects on lower levels, including direct effects, indirect effects (spillover effects), substitute effects, and neutral effects [41]. The focus of the present research is on spillover effects. Indirect or spillover effects between two levels occur unintentionally when processes or conditions at the higher level influence what happens at another level, although such effects were not originally planned [41,42]. In existing sport research, a number of spillover effects have been documented. For example, spillover effects were found from state government spending unrelated to sport [41] and state government quality (macro level) [43] on individual sport participation (micro level). In the corporate sector, positive spillover effects regarding gender diversity within a company were found to occur from women on supervisory boards to women on management boards [44]. Other studies reported negative spillover effects from the share of women in higher job levels to the share of women in lower job levels [45], suggesting that empirical evidence regarding gender diversity related to spillover effects is not consistent.

In the present research, spillover effects from economic and social circumstances at the state level to voluntary sport leadership in the form of critical masses of women and board gender diversity might occur. Specifically, the state level (macro level) might have an unintended impact on the organizational level (meso level) caused by geographical proximity. Said otherwise, the economic and social situation within the state where the sport governing body is located might spill over to the respective sport governing body. Within the social-ecological model [21], sport governing bodies are influenced by their economic and social environment. Therefore, the level of women's representation and gender diversity in the state environment, for example, in terms of labor market participation and women's economic opportunities as well as their social status and family responsibilities, might spill over to voluntary sport leadership in sport governing bodies.

2.3. Economic and Social State-Level Factors: Hypotheses Development

Several economic and social state-level factors are expected to determine critical masses and gender diversity on the boards of national and regional sport governing bodies. In the realm of economic factors, women's educational achievements, their type of employment, and the gender wage gap in a state might be relevant and spill over to sport boards.

First, the level of education might be relevant in terms of spillover effects from the state level to the boardrooms of sport organizations. Specifically, the level of women's education in a state results in more or fewer opportunities for women to achieve leadership positions in their professional life [18]. More highly educated women, e.g., with university degrees, can add valuable contributions to the boards of firms. Therefore, women are more likely to get employed or promoted to board positions if there are better educational opportunities [18,19]. The level of education is also relevant from the volunteering perspective, since highly educated people are more likely to serve on voluntary boards [46]. Educated people might know about the importance of voluntary work for the functioning of a society. Likewise, better educated people tend to participate more frequently in sports, knowing about their health benefits [41]. Furthermore, spillover effects were reported from national [47] and regional government spending on education [41] to individuals' sport participation. Thus, the level of women's participation in tertiary education might spill over to the organizational level and could have an influence on the presence of women in voluntary leadership positions. The first hypothesis reflects the relationship between women's education and critical masses as well as gender diversity on sport boards:

Hypothesis 1. *Sport governing bodies located in states with higher levels of women with tertiary education are more likely to achieve critical masses and gender diversity in their boardroom.*

Second, labor market participation of women might spill over to critical masses and gender diversity on sport boards. The employment situation within a country was found to have an impact on the presence of women on corporate boards [18]. Firms embedded in industries with a higher share of women employees are more likely to have at least one women on the board [48]. Furthermore, women are more likely to be on boards if there is a larger share of women in managerial positions [18], if women have equal opportunities in the job market [49], and if there is a higher share of women working full-time [20]. In the corporate literature, the focus of investigation on full-time employed women is explained by the low probability of part-time employed women reaching boardrooms, since the latter are perceived as not having the skills or experiences for leadership positions [20]. On the other hand, Rotolo and Wilson [46] reported that full-time employed people volunteer to a lesser extent than part-time workers, since they have less time for leisure activities. Fyall and Gazley [50] found that full-time employment increases the chances for women to participate in typically male positions, e.g., on the boards of sport organizations. However, the chances of full-time employed women are only higher compared to part-time employed women, not compared to full-time employed men. Furthermore, part-time employed women may have family responsibilities and may, therefore, have less leisure time [51], leaving less time to volunteer on the board of a sport governing body. The second hypothesis reflects these findings related to the type of employment:

Hypothesis 2a. *Sport governing bodies located in states with higher levels of women working full-time are more likely to achieve critical masses and gender diversity in their boardroom.*

Hypothesis 2b. *Sport governing bodies located in states with lower levels of women working part-time are more likely to achieve critical masses and gender diversity in their boardroom.*

Gender wage gap is the third economic state-level factor which might spill over to critical masses and gender diversity on sport boards. The gender wage gap reflects the earnings differences between women and men in comparable jobs, quantifying how much less women earn than their male counterparts. It has been included in studies investigating spillover effects from the country level to corporate boards as an indicator for the national level of discrimination [20]. Countries with a more equal payment of women and men tend to have more women on corporate boards [52]. Given the evident spillover effects in the corporate sector, equal payment or at least a lower gender wage gap might also increase the presence of women on sport boards. The third hypothesis reflects the relationship of payment differences between women and men and women on sport boards:

Hypothesis 3. *Sport governing bodies located in states with a lower gender wage gap are more likely to achieve critical masses and gender diversity in their boardroom.*

Turning to social state-level factors, the birth rate and divorce rate within a state shape the situation of women living in this state and might spill over to sport boards. In previous research, the birth rate was found to be related to board gender diversity, since children bring women out of the “long-term labor market, and therefore, limit opportunities for women to move up to management and supervisory board directorships” [19] (p. 637). Countries with better childcare policies enable women to better handle work and family responsibilities [53]. Spillover effects were reported from government spending on day care to board gender diversity [18]. According to Adams and Kirchmaier [20], direct data about family-friendliness of a country or state are difficult to find. Therefore, the birth rate can represent an indirect measure of family-friendliness and the compatibility of work and family obligations [20]. Another social state-level factor is the family status of women.

The higher the share of divorces within a country, the higher the likelihood for more gender-diverse boards in firms [18]. These findings result in the fourth set of hypotheses:

Hypothesis 4a. *Sport governing bodies located in states with a lower birth rate are more likely to achieve critical masses and gender diversity in their boardroom.*

Hypothesis 4b. *Sport governing bodies located in states with a higher divorce rate are more likely to achieve critical masses and gender diversity in their boardroom.*

3. Methods

3.1. Data Collection

Quantitative data were collected at two levels: the organizational level, which includes information about German sport governing bodies, and the state level, containing information about the economic and social situation within the 16 German states. The data collection at these two levels is necessary to investigate spillover effects from economic and social factors at the state level to board gender diversity at the organizational level. The organizational-level data were collected for all 961 German sport governing bodies, including national and regional sport associations and federations. The German Olympic Sports Confederation (DOSB), which is the federal umbrella organization for sport governing bodies in Germany, has 100 members. These members are 16 regional (state) sport federations, 40 national sport associations representing an Olympic sport, 26 national sport associations representing a non-Olympic sport, and 18 national sport organizations with special tasks [54]. The organizations with special tasks were excluded from the analysis, since some of them have institutions such as universities as members, not only natural persons. Additionally, not every national sport association has exactly 16 regional (state) sport associations as members. There are some discrepancies explaining the total number of 961 organizations. First, some sports are represented by more than one regional sport association. For example, there are three regional sport associations for fencing in Baden-Wuerttemberg [55]. Second, there are cases in which one regional sport association is responsible for a specific sport in more than one state. For instance, there is one joint regional golf association for the states of Lower Saxony and Bremen [56]. Third, some sports have separate national sport associations but share a regional sport association. For example, gymnastics and sport acrobatics have separate national sport associations but share one regional sport association in Bavaria [57].

Organizational-level data were gathered online and via e-mail between January and March 2021. The size and composition of the boards as well as the locations of the head offices were researched on the sport governing bodies' websites. If information could not be found online, the organizations were contacted by e-mail and asked for the missing data. Additionally, all sport governing bodies must inform their state sport federation or the DOSB once a year about their membership figures. Some of these documents can be viewed online at the websites of the DOSB and the state sport federations, respectively. Those state sport federations which did not have this file on their websites made it available on request. The membership figures for 2021 were not yet published at the time of data collection. Therefore, membership data from 2020 were included in the analysis. Despite various attempts, it was not possible to gather information about the board or memberships for 31 sport governing bodies. Thus, those organizations had to be excluded from the analysis, resulting in a final sample size of $n = 930$ sport governing bodies.

State-level data comprise information about the number of women in state population, women's highest educational attainment, and women's labor market participation. These data are part of an open-access dataset from the Quality of Government Institute (QoG), which can be downloaded from the Institute's website [58]. Data refer to 2017, since this is the most recent year for which all required information is available for all German states. Furthermore, data on the gender wage gap, birth rate, and information about marriages

and divorces in every state were taken from the Federal Statistical Office's website [59], with all data referring to the most recent year available.

Organizational-level data and state-level data were combined using the location of the head office. This criterion was selected given that some regional sport governing bodies operate beyond geographical state borders. The location of the head office can be clearly assigned to one state, and it is expected that this location is also relevant for spillover effects from state-level factors.

3.2. Measures and Variables

Table 1 displays all variables included in this study. Four measures were created to account for critical masses. First, *at least 30% women* captures the achievement of a critical mass on the sport organizations' board in terms of a share [13]. Second, three additional dummy variables (*At least 1 woman*, *At least 2 women*, *At least 3 women*) capture the number of women board members and, thus, the achievement of a critical mass in terms of a number [14].

Table 1. Overview of variables.

Variable	Description
<i>Dependent variables</i>	
At least 30% women	Share of women on the board is at least 30% (1 = yes)
At least 1 woman	At least 1 woman is on the board (1 = yes)
At least 2 women	At least 2 women are on the board (1 = yes)
At least 3 women	At least 3 women are on the board (1 = yes)
Uniform male board	Share of women on the board is 0% (1 = yes)
Skewed board	Share of women on the board is >0% and <20% (1 = yes)
Tilted board	Share of women on the board is $\geq 20\%$ and <40% (1 = yes)
Balanced board	Share of women on the board is $\geq 40\%$ and <60% (1 = yes)
<i>State-level variables</i>	
%W tertiary education	Share of women (25–64 years old) whose highest educational level is tertiary education (in %)
%W full-time employment	Share of full-time employed women (in %)
%W part-time employment	Share of part-time employed women (in %)
Gender wage gap	Difference in payments between women and men (adjusted, in %)
Birth rate	Number of births per 1000 inhabitants
Divorce rate	Share of divorced marriages within one year (in %)
%W state population	Share of women in state population (in %)
Household income	Disposable household income per inhabitant (in €)
GDP per capita	Regional GDP per capita (in thousand €)
<i>Organizational variables</i>	
%W memberships	Share of women memberships (in %)
Memberships per capita	Memberships of the organization per state inhabitant
Regional sport organization	Type of sport organization (1 = state sport organization; 0 = national sport organization)

Another set of four dummy variables measures board gender diversity according to Kanter [22], reflecting different types of boards: *Uniform male board* (0% women), *skewed board* (>0% and <20% women), *tilted board* ($\geq 20\%$ and <40% women), and *balanced board* ($\geq 40\%$ and <60% women).

Women's educational attainment (*%W tertiary education*) is measured by the share of women who completed tertiary education (Bachelor's, Master's, doctoral, or equivalent level [60]). Previous research in the corporate and sports sector indicates the higher chances of better educated women to enter the boardroom on the individual level [61,62]. Additionally, a few studies included higher education measures in investigating the impact of national-level factors on the presence of women board members in the corporate sector [18,19]. Furthermore, women's labor market participation is measured with two continuous variables capturing the share of women between 25 and 64 years working full-time (*%W full-time employment*) and part-time (*%W part-time employment*). Spillover effects were found from full-time employment to board gender diversity in the corporate

sector but not for part-time employment [20]. In existing volunteering research, mixed findings were reported. According to Taniguchi [63], women part-time workers were more likely to volunteer in general than women working full-time. In sport volunteering, full-time employment was found to increase the number of hours women volunteered [64]. Therefore, both variables are included for the analysis.

Gender wage gap is a continuous variable capturing differences in payment between men and women. It is included because countries with income gender equality tend to have more women on corporate boards [52]. The adjusted gender wage gap measure is included, meaning that structural reasons for payment differences such as dissimilar professions, education, and previous professional experiences are deducted [65]. *Birth rate* and *divorce rate* account for compatibility of women's family responsibilities, their professional career [66], and leisure activities such as volunteering on a sport board. Additionally, these variables can be seen as indirect indicators for the family-friendliness of a state [20]. The birth rate is defined as the number of given births per 1000 inhabitants [67]. The divorce rate reflects the number of divorces divided by the number of marriages within a year (and multiplied by 100). Both variables were already implemented in individual-level and national-level gender studies on boards [18,19,68].

Finally, the share of women on sport boards might also be influenced by the share of women in state population, disposable household income, and the gross domestic product (GDP). Therefore, *%W state population*, *household income*, and *GDP per capita* were implemented as state-level control variables.

Three additional control variables were created at the organizational level: the share of women memberships (*%W memberships*), memberships per state inhabitant (*Memberships per capita*), and a dummy variable capturing whether the sport governing body is a *regional sport organization* or a national sport organization.

3.3. Statistical Analysis

In the first step, descriptive statistics were provided to give an overview of the data structure. Afterwards, three sets of logistic regression models were estimated. All dependent variables were dummy variables capturing critical masses and specific types of board gender diversity. Every set included one model with a critical mass in terms of a share (at least 30%; [13]) and three models with a critical mass in terms of a number (at least 1, 2, and 3 women; [14]). Furthermore, four models were estimated for board gender diversity using different types of boards (uniform male, skewed, tilted, and balanced board) according to Kanter [22] as dependent variables.

The independent variables were tested for multicollinearity with correlation analysis and variation inflation factors. After inspecting the correlation coefficients, two decisions were made with regard to multicollinearity issues. First, household income and GDP per capita were highly correlated with each other and with birth rate. Hence, household income and GDP per capita could not be included in the models as state-level control variables. Additionally, since the three variables measuring women's educational attainment, full-time employment, and part-time employment were correlated, they could not be included in the same model, resulting in three separate sets of models. Beyond these issues, multicollinearity should not be a problem. All other correlation coefficients are below the critical threshold of 0.8, and all VIFs are below 5 [69]. The independent variables include the remaining organizational-level and state-level variables from Table 1. All regressions were estimated with robust standard errors clustered at the state level [70]. A significance level of $\alpha = 0.05$ was applied to all models.

4. Results

Table 2 shows the descriptive statistics. Altogether, 24.1% of sport governing bodies in the sample have at least 30% women board members. While most of the organizations have at least one woman on their board (78.4%), half of the boards (50.4%) include at least two women, and less than one-third (28.2%) achieve a critical mass of at least 3 women in

Table 3. Cont.

Variable	Model 1: At Least 30% Women	Model 2a: At Least 1 Woman	Model 2b: At Least 2 Women	Model 2c: At Least 3 Women	Model 3a: Uniform Male Board	Model 3b: Skewed Board	Model 3c: Tilted Board	Model 3d: Balanced Board
Gender wage gap	0.016 **	0.029 ***	0.008	−0.017	−0.029 ***	0.016	−0.001	0.019 ***
Birth rate	−0.026	−0.001	−0.015	−0.036 *	0.001	0.017	−0.012	−0.005
Divorce rate	0.006 **	0.001	0.004 *	0.006 *	−0.001	−0.001	0.001	0.002
%W state population	−0.012	0.002	−0.173	−0.160	−0.002	−0.027	0.006	−0.030
Organizational variables ¹	YES	YES	YES	YES	YES	YES	YES	YES
R ²	0.131	0.056	0.100	0.117	0.056	0.049	0.008	0.088
χ ²	195.13 ***	83.76 ***	81.54 ***	163.90 ***	83.76 ***	76.35 ***	36.33 ***	130.67 ***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; displayed are the average marginal effects; all models are estimated with robust standard errors clustered at the state level; ¹ included are all organizational-level control variables displayed in Table 1.

Table 4. Regression models for critical masses and board gender diversity on sport governing bodies' boards (incl. full-time employment).

Variable	Model 4: At Least 30% Women	Model 5a: At least 1 Woman	Model 5b: At Least 2 Women	Model 5c: At Least 3 Women	Model 6a: Uniform Male Board	Model 6b: Skewed Board	Model 6c: Tilted Board	Model 6d: Balanced Board
%W tertiary education	-	-	-	-	-	-	-	-
%W full-time employment	0.014 ***	−0.002	0.007	0.006	0.002	−0.013 *	0.003	0.001
%W part-time employment	-	-	-	-	-	-	-	-
Gender wage gap	0.001	0.032 ***	0.001	−0.024 **	−0.032 ***	0.030 *	−0.005	0.017 ***
Birth rate	−0.007	−0.004	−0.008	−0.027	0.004	−0.004	−0.006	−0.006
Divorce rate	0.005 **	0.001	0.003	0.005 *	−0.001	−0.001	0.001	0.002
%W state population	−0.017	0.003	−0.175	−0.161	−0.003	−0.024	0.006	−0.030
Organizational variables ¹	YES	YES	YES	YES	YES	YES	YES	YES
R ²	0.132	0.056	0.101	0.117	0.056	0.047	0.008	0.087
χ ²	178.98 ***	64.85 ***	83.99 ***	158.23 ***	64.85 ***	77.35 ***	36.31 ***	124.99 ***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; displayed are the average marginal effects; all models are estimated with robust standard errors clustered at the state level; ¹ included are all organizational-level control variables displayed in Table 1.

Table 5. Regression models for critical masses and board gender diversity on sport governing bodies' boards (incl. part-time employment).

Variable	Model 7: At Least 30% Women	Model 8a: At Least 1 Woman	Model 8b: At Least 2 Women	Model 8c: At Least 3 Women	Model 9a: Uniform Male Board	Model 9b: Skewed Board	Model 9c: Tilted Board	Model 9d: Balanced Board
%W tertiary education	-	-	-	-	-	-	-	-
%W full-time employment	-	-	-	-	-	-	-	-
%W part-time employment	−0.014 ***	0.005	−0.004	−0.006	−0.005	0.026 ***	−0.012 ***	−0.002
Gender wage gap	0.012 *	0.029 ***	0.006	−0.019 *	−0.029 ***	0.024	−0.002	0.018 ***
Birth rate	0.007	−0.009	−0.004	−0.021	0.009	−0.032	0.006	0.001
Divorce rate	0.005 *	0.001	0.004 *	0.005 *	−0.001	−0.000	4.050	0.002
%W state population	−0.066	0.023	−0.180 *	−0.182 *	−0.023	0.064	−0.039	−0.037
Organizational variables ¹	YES	YES	YES	YES	YES	YES	YES	YES
R ²	0.131	0.057	0.100	0.117	0.057	0.056	0.011	0.087
χ ²	150.86 ***	50.39 ***	83.24 ***	165.65 ***	50.39 ***	69.37 ***	80.80 ***	123.01 ***

Note: * $p < 0.05$, *** $p < 0.001$; displayed are the average marginal effects; all models are estimated with robust standard errors clustered at the state level; ¹ included are all organizational-level control variables displayed in Table 1.

Starting with tertiary-educated women, Model 1 displays a significant positive effect, and Model 3b displays a significant negative effect. A higher share of women with degrees from tertiary education increases the likelihood of at least 30% of board members being

women and decreases the likelihood of a skewed board. The first hypothesis can be confirmed for a critical mass in terms of a share and skewed boards.

The same effects can be found for the share of full-time employed women: A higher share of women working full-time significantly increases the likelihood of at least 30% women on the board, while significantly decreasing the likelihood of a skewed board. In contrast, the share of part-time employed women significantly decreases the likelihood of at least 30% women on the board. Looking at the models for board gender diversity, a higher share of women working part-time decreases the likelihood of a tilted board but makes it more likely that the board is skewed. Thus, the results support Hypotheses 2a and 2b with regard to a critical share of women, skewed boards, and tilted boards.

Gender wage gap has a significant positive effect on the likelihood of a critical mass of at least 30% women, but only in the models including women's tertiary education and part-time employment.

Looking at the models analyzing critical masses in terms of numbers, a higher gender wage gap increases the likelihood that at least one woman is on the board. In contrast, the higher the gender wage gap, the lower the likelihood of at least three women board members. This effect is negative in all three sets of models but only significant in the sets with full-time and part-time employment. The effect of gender wage gap is also significantly positive in some of the models with board gender diversity measures as dependent variable. When the gender wage gap is higher, it is more likely that boards are skewed (set with full-time employment) or balanced (all sets). The effects for gender wage gap are significantly negative in all three sets in the model with a uniform male board, meaning that a lower gender wage gap increases the likelihood of a board without any women. Therefore, the results do not support Hypothesis 3.

Turning to the measures of family responsibilities, significant effects can only be found in the models for critical masses. The effect for birthrate is only negative and significant in the first set for at least three women on the board, hence partially supporting Hypothesis 4a.

Several effects appear for the divorce rate. A higher divorce rate significantly increases the likelihood of at least 30% women board members and at least three women in all sets. Additionally, the higher the divorce rate, the more likely the achievement of at least two women on the board in the sets with women's tertiary education and part-time employment. Hypothesis 4b can be confirmed for these critical masses.

5. Discussion

The aim of this study was to examine spillover effects from economic and social state-level factors on critical masses and gender diversity on the boards of German sport governing bodies. One-quarter (24.1%) of the examined sport organizations have at least 30% women on their board, and nearly one-third of the boards include at least three women board members. These results show that some organizations have already achieved critical masses and may benefit from the related economic and social sustainability advantages. On the other hand, 21.5% of all organizations still have a uniform male board, and only 10.7% of the boards are balanced. Due to their traditional structure and organizational culture, sport organizations are often slow when it comes to demand for change [71]. The structure of sport governing bodies makes it possible for leaders to resist or ignore such demands for a long time, even if there is pressure from society or from political actors [72]. In summary, there is still a long way to go to achieve the gender equality in German sport governance sought by the UN [1] and the IOC [73].

The first hypothesis postulating a positive association between women's higher educational attainment within a state and women's representation on sport boards is largely supported. The range for the shares of women with tertiary education between the states is large (18.7–42.1%; Table 2). Having the spillover effects from government spending on education to sport participation in mind [47], this range could be explained by the decentralized education system in Germany. Every state has its own policies regarding its educational services [74]. For example, the educational attainment is lower in the Eastern

states and in rural and sparse areas with a higher share of elderly people [75]. The share of women with tertiary education in a state seems to spill over to the board of sport governing bodies. The higher the share of women with higher education, the higher the likelihood that the sport boards within that state include at least 30% women while decreasing the likelihood that the board is skewed ($>0\%$ but $<20\%$ women). The effect for a critical mass in terms of a number is insignificant, demonstrating that it is important to include both critical mass measures in such studies [16]. These findings underline the importance of investigating environmental factors, showing that not only individual education is relevant for women to achieve boardroom positions [76]. If more women have the opportunity to invest in their human capital, more talented women may enter the work force and may have the skill set to achieve leadership positions. This finding is in line with studies from the corporate sector [18,19] and voluntary sports sector [46].

Similarly, the findings largely support Hypotheses 2a and 2b, indicating that spillover effects from the share of full-time employed women within a state do not only spill over to corporate boards [18,20], but also to sport boards. Thus, both education and employment seem to be buffers against skewed boards and facilitate the achievement of a critical mass of women of at least 30%. When states have a higher share of full-time employed women, it is more likely that women have equal opportunities in the labor market [49] as well as in the voluntary sports sector [50]. This spillover effect indicates that voluntary work on a sport board is not a substitute for paid full-time labor; rather, it complements it.

On the contrary, a higher share of part-time employed women decreases the likelihood of sport boards having a relative critical mass of women board members, while increasing the likelihood that the boards have less than 20% women board members. The negative spillover effect of part-time employed women to a critical mass of women on sport boards could be explained by considering the different jobs that are common in full-time or part-time employment. Part-time work is one solution for women to handle family and childcare responsibilities while still remaining in the labor market. However, part-time employment is less common in higher-level jobs, which are necessary to climb up the career ladder, whereas part-time employment is much more common in low-paid jobs [77]. In contrast, voluntary board members tend to be managers in their professional life [46], indicating that board members might be full-time workers.

The size of the gender wage gap seems to be an important economic state-level factor for the presence of critical masses and for the level of board gender diversity in voluntary sport leadership. While previous studies from the corporate sector found a spillover effect from equal payment (lower gender wage gap) to the presence of women board members [20,52], this effect could not be found in this study. The results suggest that the opposite effect occurs for sport boards. The higher the gender wage gap, the higher the likelihood that boards achieve critical masses and a balanced board composition. Equal payment conditions within a state seem to increase the likelihood of a uniform male board. These findings may be caused by the problem that highly educated women, regardless of the type of their employment, are less often considered for leadership positions than equally educated men [78]. As a result, these women may decide to invest their knowledge and their skills in another area of their lives, e.g., in leisure activities such as volunteering. Thus, these other areas might be substitutes for professional work [79]. Within the multi-level framework, substitution effects are distinguished from spillover effects [41]. This consideration is supported by the finding that women spend less time on volunteering in countries with a lower gender wage gap [80]. Thus, while spillover effects occur for the gender wage gap in the corporate sector, substitution effects are evident in the voluntary sports sector. The negative effects for gender wage gap in the models with at least three women in the sets with full-time and part-time employment indicate that the substitutional effect might not necessarily apply to a critical mass of women in terms of a number.

A higher birth rate decreases the likelihood of at least three women board members in the models including women's tertiary education, confirming Hypothesis 4a. This finding is in line with studies from the corporate sector, indicating that children push women out

of the labor market [19]. Women still face the decision to either follow their career path or become a mother and have to accept negative effects such as lower income [81] and a lower chance to achieve leadership positions. Literature from the voluntary sector indicates that having children is in general positive for the likelihood of volunteering, but only when there are school-aged children in the household [82]. Having pre-school children who are aged between 0 and 5 years decreases the likelihood that the parents volunteer [83]. Thus, women may return to voluntary activities in their leisure time after their children go to school. However, with regard to the findings for full-time and part-time employment and having in mind that sport board members tend to be in higher job levels in their professional life [46], it is possible that these women will be considered for leadership positions to a lesser extent.

Contributing to study results from the corporate sector [18], higher divorce rates seem to spill over to critical masses of women board members in sport governing bodies. Women might be forced to return to the labor market after divorce, since they have a much higher loss in income than men [84]. On the other hand, women stay more often at home to take care of children during a marriage than men do. Thus, it is reasonable that divorced women might have to invest less in their human capital during these years and might have more problems when returning to the labor market [85]. Based on these relationships, the same logic can be applied as for the effect of the gender wage gap: Women who are divorced might have been out of the labor market for a longer time and might have fewer chances of being considered for professional leadership positions upon their return. Therefore, bringing in their knowledge in voluntary sport leadership might be an appropriate alternative.

In summary, the present study indicates that the achievement of critical masses and a higher participation of women on sport boards is not only shaped by organizational factors, but also by the economic and social situation of women in different German states. The educational attainment of the women population and their labor market participation in a state were found to spill over to sport boards located within the respective state. Controversially, a higher gender wage gap has a positive effect in terms of the achievement of critical masses of women in the boardroom of sport governing bodies. Thus, voluntary work in sport leadership might be a substitute for paid work in states where women generate comparably less money than men in their regular paid jobs. This effect might change if there were more equal opportunities for women and men to achieve leadership positions in their professional life. In contexts where women are less likely to be seen as professional leaders [78], the voluntary sports sector might benefit from women deciding to bring in their skills in their leisure time. Additionally, social state-level factors such as birth and divorce rate play a role if sport organizations achieve critical masses and a high level of board gender diversity.

6. Conclusions

The purpose of this study was to investigate the role of economic and social state-level factors in the gender composition of sport boards. Drawing on a multi-level framework, critical mass theory [13,22], and gender diversity reflected by different types of boards [22], several spillover effects could be found from the sport organizations' environmental surroundings. The representation of women as board members is not only relevant to social sustainability, but also to improving the organizations' performance to achieve economic sustainability. This study examines women on sport boards through the lens of critical masses and gender diversity and underlines the importance of an equal participation in leadership positions to achieve social sustainability. Additionally, the study indicates that there is a relationship between economic state-level factors and women in volunteer sports leadership positions. To improve sport governance, these findings may motivate sport policy makers to focus on the issue of economic sustainability.

The results of this study can contribute to the literature in several ways. This study acknowledges the embedding of sport governing bodies in a broader environment by using

a multi-level framework. The framework is suitable for studying the impact of higher levels, such as the state level, on organizations embedded in that geographic environment. The present research is the first study focusing on economic and social factors at a higher level to explain critical masses of women and levels of gender diversity on sport boards. Comparable studies in the corporate sector have already examined country-level factors. However, this study suggests that not only nationwide factors are important to consider, but also those of the state context. Additionally, not only the share of women on the board was considered as a dependent variable, but also different measures for critical masses and types of boards. Collectively, these measures reveal a more nuanced picture of the situation of women in volunteer sports leadership positions.

Theoretical and practical implications arise from this study for politicians and sport policy makers. They need to recognize that the structure and actions of sport governing bodies are not only driven by factors internal to an organization but are also shaped by their geographical environment and the economic and social conditions within their surroundings. Political actors may need to not only call for gender equality in leadership positions but also recognize that they can more actively contribute to the promotion of this development. This promotion could be achieved by improving the living conditions (for women) in the states. For example, structures and conditions can be created under which women and men can obtain higher educational qualifications, regardless of their financial background. Moreover, women are still disadvantaged when they enter family structures with children and marriage. The return to work and social life should be made easier for women, i.e., by providing more childcare services and designing measures to support women in their career planning despite having children. Sport policy makers at higher levels may communicate the economic and social benefits of critical masses and more gender-diverse boards, such as making better decisions [32] or experiencing fewer financial problems [15]. Sport leaders at all organizational levels need to know that they have to actively change recruitment and nomination practices for board positions to make them more sustainable. These changes could ensure that the organization benefits in terms of both economic and social sustainability. Further theoretical implications are of importance to consider critical masses in terms of shares and numbers, since they may be affected by different factors. Additionally, a multi-level framework seems to be appropriate to examine spillover effects from the state environment to board gender diversity in sport organizations. The substitution effect for gender wage gap, which was found to be a spillover effect in the corporate sector, implies that economic and social factors at the state level might have different effects in the voluntary sector than in the private sector.

The present study has some limitations that can guide future research. First, the research context is limited to sport organizations and the economic and social situation in Germany. It would be interesting to investigate states of other countries within and outside Europe to generate knowledge about differences or similarities. Second, the study only accounts for presence of women on the board, not for their position or the duration of their board participation. Further research could take a closer look at the role of factors in the organizations' environment that might be important for the occupation of chair positions or the number of election terms women remain on the board. Third, the data in this study are only cross-sectional in nature. The results are limited to the time of data collection and availability of data. Studies with longitudinal data could examine how sport organizations respond over time to political and social calls for more gender equal leadership. Finally, the different effects of gender wage gap on a critical mass of women in terms of a share or a number are interesting and could be investigated in more detail in further studies exploring other sport governing bodies. The substitution effect for gender wage gap needs further investigation. For example, exploring the choices of women in voluntary leadership positions might help to determine which economic and social factors are enhancing or inhibiting their efforts to reach the boardrooms of non-profit sport organizations.

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