

IFN Working Paper No. 1561, 2026

Elite Participation as a Measure of Global Development

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Abstract

Treating development as the ability to participate in complex, non-subsistence, globally comparable activities, this paper proposes participation in elite activities as an indicator of global development. Using standardized rankings from 1970 to 2025 across domains, including sports, chess, supercomputing, and fine dining, adjusted Shannon diversity and Herfindahl concentration indices are calculated. Results show that global elite diversity has increased and concentration has decreased across all studied areas. Global convergence is nearly complete for the measure with the lowest bar (having a national football team). These trends provide a development perspective less sensitive to purchasing power parity distortions.

JEL Classification

D31, D63, I32, O10, O15, Z20

Keywords

Global development; global inequality; poverty measurement; leisure and sports participation; purchasing power parity; welfare measurement

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Financial support from Jan Wallanders och Tom Hedelius Stiftelse (grant P23-0186) is gratefully acknowledged

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Introduction

Standard assessments of global economic development rely heavily on income-based indicators such as GDP per capita, international poverty lines, and global inequality indices constructed using purchasing power parity (PPP) adjustments. These measures suggest substantial global progress since the late twentieth century, including large reductions in extreme poverty and a narrowing of income gaps between countries (Milanovic 2024, Waldenstrom 2024).

At the same time, a large literature has raised concerns about the extent to which PPP-adjusted income measures accurately reflect welfare-relevant improvements in living standards, particularly in poorer countries. PPP comparisons depend on reference price systems and are sensitive to the treatment of non-tradable goods and services, which tend to be cheaper in low-income economies. As a result, measured real incomes may overstate access to goods, activities, and capabilities that are priced on global markets (Deaton 2010, Hickel 2016, 2019). While income-based indicators remain indispensable, these concerns motivate the use of complementary approaches that capture development outcomes more directly tied to participation in globally comparable activities.

This paper proposes that the ability of countries to participate at the global frontier of non-subsistence activities as a simple, intuitive and easily measured indicator of global development. If measures of economic growth and declining poverty world-wide translate into meaningful improvements in material conditions, that should be reflected in a broader set of countries being represented at the global elite of activities that require substantial surplus resources, time, health, infrastructure, and integration into global systems.

Elite activities are particularly informative for three reasons. First, participation at the top of global rankings is highly income-elastic and institutionally demanding, making it sensitive to sustained economic development rather than short-term income fluctuations. Second, these activities rely on globally priced inputs, such as international travel, equipment, training, and advanced technology, and are therefore less affected by PPP distortions arising from cheap local non-tradables. Third, and perhaps most importantly, elite rankings are standardized and comparable across countries and over time, allowing for transparent and accurate measurement of changes in global participation patterns.

This paper examines elite participation across a set of globally competitive domains using sports rankings (tennis, golf, alpine skiing), chess ranking, hosting super computers, fine dining restaurants and presence of a national football team over the period 1970 to 2025. For each domain and several points in time, a fixed elite set is defined by using transparent and established rankings. Using the nationality of top-performers, two standard diversity measures are computed and adjusted for the increasing global number of countries since 1970: the Shannon entropy (or diversity) index, and the

Herfindahl concentration index (Shannon 1948, Herfindahl 1950, Hirschman 1964).² Applying identical measurement principles across domains allows for direct comparison of trends in global elite participation. The central question is whether the broad-based global progress suggested by income-based indicators is mirrored by a corresponding expansion in the set of countries able to reach the global elite.

2. Data.

The analysis examines elite participation across a set of globally competitive activities. For each activity, a fixed elite set is defined based on established global rankings or listings. For the following sports/games, we use the nationalities represented in the global top-25 according to well established rankings (at year/season ends): Alpine Skiing (World Cup overall standings), Chess (FIDE World Rankings), Tennis (The ATP and WTA Rankings), Golf (Official World Golf Ranking, Women's World Golf Rankings). For fine dining we use The World's 50 Best Restaurants, as published by William Reed (which started as a feature in British magazine *Restaurant* in 2002). For supercomputers we use the country of the computers in the top of the rankings based on LINPACK performance (SOURCE) published since 1993 in the Top500-project. Finally, for national football teams we used data from FIFA Fédération Internationale de Football Association (1970–2025).³ Country affiliation is assigned based on nationality for individual-based activities, institutional location for supercomputers, and venue location for restaurant rankings. Data sources are summarized in table 1.

For each activity and year, three measures of country participation are computed. First, the number of countries represented in the elite set provides a simple count-based measure of participation breadth. Second, diversity is measured using the Shannon entropy index, defined over country shares in the elite set (Shannon, 1948). Third, concentration is measured using the Herfindahl index, computed as the sum of squared country shares (Herfindahl, 1950; Hirschman, 1964). Both the Shannon and Herfindahl indices are adjusted for the changing number of countries that exist in each year, ensuring that changes in the indices reflect shifts in the distribution of elite participation rather than mechanical effects of an expanding country set. Higher Shannon values indicate greater diversity, while higher Herfindahl values indicate greater concentration.

² The global number of countries are compiled from Wikipedia, and increases from 166 in 1970 to 198 in 2025.

³ Note “Relevance, opportunity and diversity”, <https://www.theworlds50best.com/stories/News/worlds-50-best-voting-rules-changes.html> and the FIFA-rule that a women's team is necessary

Table 1. Data description

Activity	Data description	Source
Alpine skiing (men & women)	World Cup overall standings, 1970-2025, every 5 years	Fédération Internationale de Ski et de Snowboard. World Cup standings. https://www.fis-ski.com
Tennis (men and women)	Year-end rankings 1970-2025, every 5 years	Association of Tennis Professionals (ATP) Rankings. https://www.atptour.com , the 1970 Grand Prix rankings. Women's Tennis Association (WTA) Rankings. https://www.wtatennis.com , World Tennis magazine rankings (compiled by Joseph Macauley).
Golf (men & women)	Year-end world rankings, 1970-2025, every 5 years	Official World Golf Ranking (1986–2025). World Rankings. https://www.owgr.com . PGA Tour Official Money List. Women's World Golf Rankings (WWGR, 2006-2025). https://www.randa.org/world-rankings , LPGA Official Money List. ⁴
Chess	FIDE Elo rating, 1970–2025. International Chess Federation (FIDE)	FIDE World Rankings. https://www.fide.com
Restaurants (Top 50)	Annual top 50 restaurant rankings from The World's 50 Best Restaurants. 2003, 2004-2024, every second year.	William Reed Business Media (2003–2024). The World's 50 Best Restaurants. https://www.theworlds50best.com
Supercomputers (Top 500 / Top 50)	Rankings based on LINPACK performance from the TOP500 Project. 1993–2025, bi-annual.	Meuer et al. (1993–2025). TOP500 Supercomputer Sites. https://www.top500.org
Football (national teams)	FIFA	Fédération Internationale de Football Association (1970–2025). Member Associations. https://www.fifa.com

⁴ For women's golf prior to the introduction of official world rankings, elite participation is measured using LPGA season money lists, which constituted the primary global elite circuit at the time.

Analysis

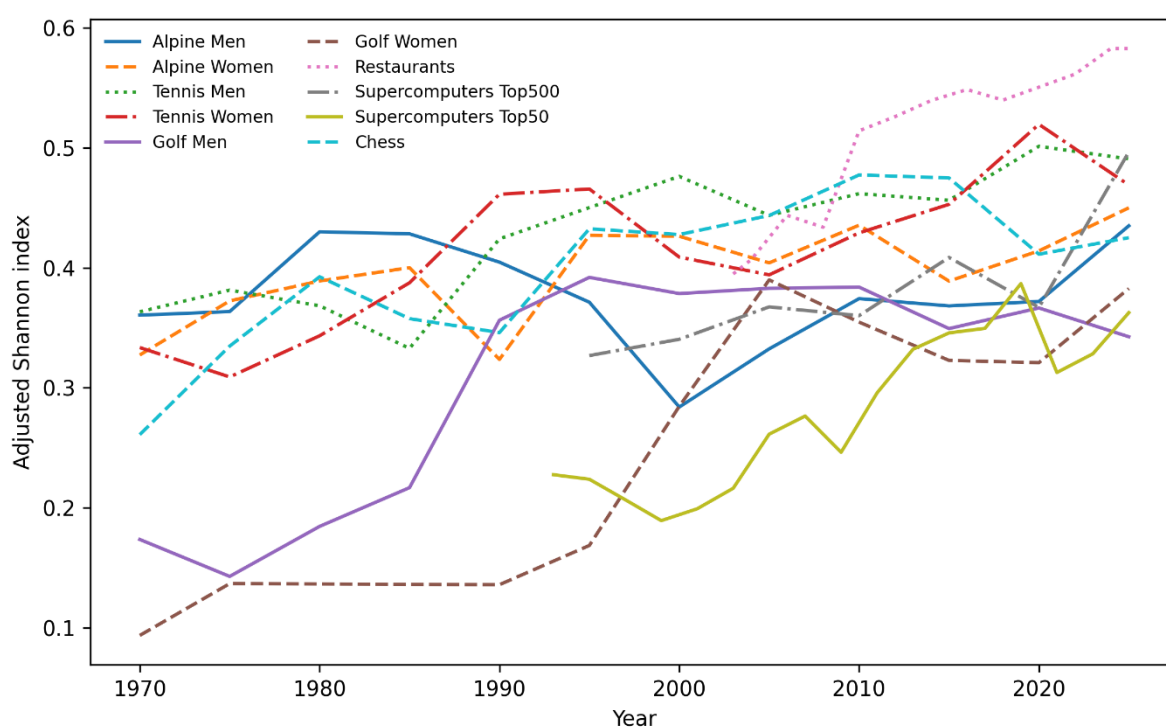
Table 2 summarizes the start and end values of the (adjusted) Herfindahl index and Shannon index. In all areas concentration decreases and diversity increases. The change is smallest for men's alpine skiing, and largest for women's golf.

Table 2. National diversity in top-25 rankings 1970-2024/25

Activity	Herfindahl index (adj.)			Shannon index (adj.)		
	Start	End	Δ	Start	End	Δ
Alpine skiing (men)	0,18	0,11	-0,07	0,36	0,44	0,08
Alpine skiing (women)	0,22	0,10	-0,12	0,33	0,45	0,12
Chess	0,43	0,14	-0,29	0,26	0,43	0,16
Golf (men)	0,72	0,34	-0,38	0,17	0,34	0,17
Golf (women)	0,84	0,26	-0,58	0,09	0,38	0,29
Restaurants (Top 50, 2004-)	0,15	0,05	-0,10	0,40	0,58	0,19
Supercomputers (Top 50, 1993-)	0,41	0,31	-0,11	0,23	0,36	0,14
Supercomputers (Top 500, 1993-)	0,33	0,15	-0,18	0,33	0,50	0,17
Tennis (men)	0,24	0,08	-0,16	0,36	0,49	0,13
Tennis (women)	0,32	0,10	-0,22	0,33	0,47	0,14

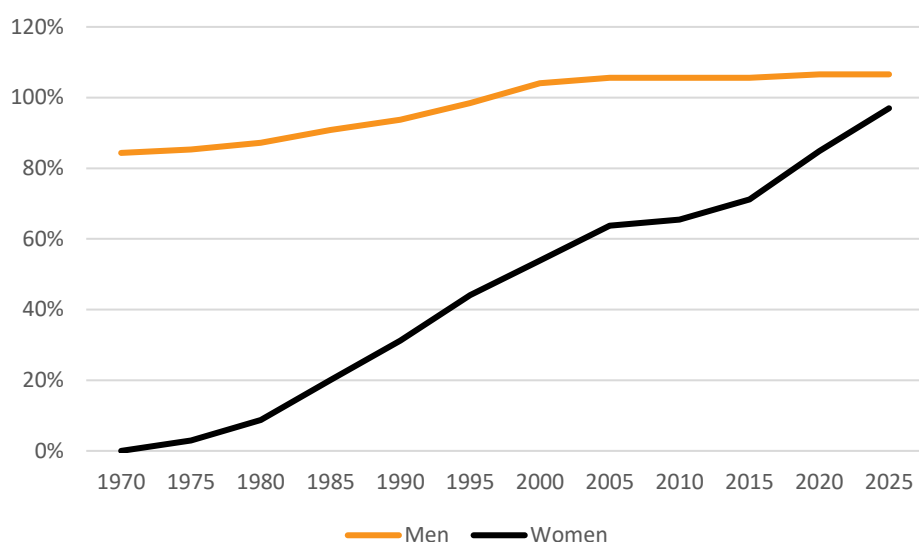
To graphically illustrate development over time, Figure 1 plots the adjusted Shannon-index over time for all indicators listed in Table 2.

Figure 1. Shannon-diversity index over time



Finally, Figure 2 illustrates a similar measure with a lower bar: The share of countries that have an official national football team. The share of countries with a men's team has increased from 84 percent in 1970 to 106 percent in 2025.⁵ More remarkable is that the corresponding share for 'countries with a women's team increases from 0 to 97 percent.⁶ By the early 2020s, major football governing bodies strengthened women's football requirements within club licensing frameworks, incentivizing the establishment of women's teams (FIFA 2022). But at that point, roughly 80 percent of countries already had one.

Figure 2. The share of countries with a national football team.



Concluding discussion

In summary, the results show that global elite diversity has increased over time, while concentration has declined. Global convergence is nearly complete for the measure with the arguably lowest entry threshold, namely the existence of a national football team. In contrast, elite alpine skiing remains only marginally more diverse today than in the 1970s. Importantly, none of the measures examined display a long-run trend toward increasing concentration or declining diversity.

Shifting the analytical focus from real income measures inevitably expands the set of potential indicators. However, this is primarily a challenge of data acquisition rather than conceptual validity. Selecting a diverse array of high-stakes activities, this paper demonstrates that non-monetary metrics

⁵ Exceeding 100 percent is possible because some countries have more than one team. For example, the United Kingdom has four separate national football teams: England, Scotland, Wales, and Northern Ireland.

⁶ Countries that at the time of writing does not have a women's team include Afghanistan, Yemen, Eritrea, South Sudan.

based on rankings can successfully be used to quantify global development. Hopefully future research will extend the analysis to additional domains, thereby complementing conventional monetary measures further.

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