

UNIVERSIDADE FEDERAL DO PARANÁ

JEFERSON SILVA HENRIQUE

*OCEAN OR AQUARIUM CAPITALISM: A STUDY ON THE PERFORMANCE OF  
HIGHER EDUCATION INSTITUTIONS IN GLOBAL SUSTAINABLE RANKINGS  
AND THE NATIONAL CONTEXT*

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HIGHER EDUCATION INSTITUTIONS IN GLOBAL SUSTAINABLE RANKINGS  
AND THE NATIONAL CONTEXT*

Dissertação apresentada ao curso de Pós-Graduação em Administração, Setor de Ciências Sociais Aplicadas, Universidade Federal do Paraná, como requisito parcial à obtenção do título de Mestre em Administração.

Orientadora: Profa. Dra. Bárbara Galleli Dias.

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BÁRBARA GALLELI DIAS

Presidente da Banca Examinadora

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FLÁVIO HOURNEAUX JUNIOR

Avaliador Externo (FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE - FEA)

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“O racionalista crítico não promete que suas hipóteses sejam verdadeiras,  
mas apenas que são as mais conhecidas até agora.”

*Karl Popper*

“A liberdade é a razão de ser da vida política e, sem ela, nem a ordem, nem  
a lei, nem o poder, nem mesmo a força das armas, podem preservar a comunidade.”

*Hannah Arendt*

“Os maiores cientistas também são sempre artistas.”

*Albert Einstein*

"A música é uma revelação superior a toda sabedoria e filosofia."

*Ludwig van Beethoven*

## RESUMO

A atual crescente instabilidade global exige um exame mais atento do desempenho das Instituições de Ensino Superior (IES) relativamente aos desafios do Desenvolvimento Sustentável (DS). Empregamos a teoria das Variedades do Capitalismo (VoC) para investigar como as dimensões institucionais nacionais impactam o desempenho sustentável das IES e suas ações relacionadas aos 17 Objetivos de Desenvolvimento Sustentável (ODS). A nossa base de dados tem como referência o Ranking de Impacto do Times Higher Education (THE) e abrange o período de 2019 a 2023, totalizando 3.749 IES, em 59 países. Incorpora os índices nacionais em nível institucional, a maioria proveniente da base de dados do Banco Mundial. A partir da análise quantitativa de dados em painel, os resultados revelam uma influência significativa de cada dimensão nas IES, enfatizando que os países caracterizados por elevada liberdade económica, desenvolvimento humano consistente e regras de governança bem estabelecidas contribuem mais para o DS. Também introduzimos uma estrutura para analisar o contexto exógeno de conformidade institucional para as organizações, destacando que as nações que se destacam pela liberdade econômica (capitalismo de oceano) superam aquelas com maior coordenação (capitalismo de aquário). As conclusões destacam a importância da consideração das dimensões do capitalismo nacional na formulação de estratégias para as IES e oferecem contribuições significativas para um campo de pesquisa pouco explorado. Ao introduzir uma nova perspectiva analítica, a pesquisa proporciona insights valiosos para a formulação de políticas governamentais que promovam práticas sustentáveis. As contribuições teóricas enriquecem os domínios da sustentabilidade e da educação para o DS, fornecendo dados estruturados anteriormente ausentes na literatura. Socialmente, o estudo desafia a concepção tradicional de "melhor universidade" em termos de DS, considerando a realidade econômica das instituições e alinhando-se aos ODS, evidenciando a correlação positiva entre os ODS e a melhoria de indicadores sociais como pobreza, desigualdade de gênero, fome e desemprego nas classificações globais.

**Palavras-chave:** Desenvolvimento Sustentável, Desempenho Sustentável, Instituições de Ensino Superior, Variedades de Capitalismo, Times Higher Education Impact Ranking.

## ABSTRACT

The escalating global instability demands a closer examination of Higher Education Institutions' performance toward Sustainable Development (SD) challenges. We employ the Varieties of Capitalism (VoC) theory to investigate how national institutional dimensions impact HEIs' sustainable performance and their actions related to the 17 Sustainable Development Goals (SDGs) - focusing on the Times Higher Education (THE) Impact Ranking. Our database spans 2019 to 2023, covering 3,749 HEIs in 59 countries. It incorporates the national institutional-level indexes, most from the World Bank database. Through quantitative panel data analysis, we developed robust econometric models to scrutinize the relationship between VoC dimensions (labor, finance, inter-firm relations, education, and governance) and HEIs' sustainable performance. The results reveal a significant influence of each dimension on HEIs, emphasizing that countries characterized by elevated economic freedom, consistent human development, and well-established governance rules contribute more to SD. We also introduce a framework to analyze the exogenous context of institutional conformity for organizations, highlighting that nations that embrace economic freedom (ocean capitalism) outperform those with greater coordination (aquarium capitalism). The conclusions highlight the importance of considering the dimensions of national capitalism when formulating strategies for HEIs and offer significant contributions to an underexplored field of research. The research provides valuable insights for formulating government policies that promote sustainable practices by introducing a new analytical perspective. The theoretical contributions enrich sustainability and SD education by providing structured data previously absent in the literature. Socially, the study challenges the traditional conception of "best university" in terms of SD, considering the economic reality of institutions and aligning with the SDGs, highlighting the positive correlation between the SDGs and the improvement of social indicators such as poverty, inequality of gender, hunger and unemployment in global rankings.

**Keywords:** Sustainable Development, Sustainable Performance, Higher Education Institutions, Varieties of Capitalism, Times Higher Education Impact Rankings.

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## LIST OF ABBREVIATIONS AND ACRONYMS

AEE	- Advanced Emerging Economies
AISHE	- Auditing Instrument for Sustainability in Higher Education
AOE	- Arab Oil-Based Economies
CME	- Coordinated Market Economies
EAC	- Economies of Advanced Cities
EME	- Emerging Economies
EPE	- European Peripheral Economies
ESD	- Education for Sustainable Development
GASU	- Graphical Assessment for Sustainability in Universities
HCE	- Highly Coordinated Economies
HEI	- Higher Education Institution
LME	- Liberal Market Economies
MDG	- Millennium Development Goals
SD	- Sustainable Development
SDG	- Sustainable Development Goals
SOE	- Socialist Economies
STARS	- Sustainability Tracking, Assessment and Rating System
THE-WUR	- Times Higher Education World University Rankings
UAE	- United Arab Emirates
UK	- United Kingdom
UN	- United Nations
USA	- United States of America
VOC	- Varieties of Capitalism
WCED	- World Commission of Environment and Development

## LIST OF SYMBOLS

® - Trademark

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## 1 INTRODUCTION

Amid global challenges, including global warming, the COVID-19 pandemic, and the Russia-Ukraine war, urgent responses from various social actors are essential (Mbah & Wasum, 2022). The United Nations (UN) is pivotal in formulating agreements and policies to address these crises and meet socio-environmental demands (Žalėnienė & Pereira, 2021). Developed and developing countries actively participate in global Sustainable Development (SD) efforts, implementing the 17 Sustainable Development Goals (SDGs) from the 2030 Agenda (Jeremić & Sachs, 2014). At a World Economic Forum meeting in Davos, the Secretary-General underscored the need for increased international cooperation and reforms in global governance, emphasizing the importance of representation from the Global South (Guterres, 2024).

Worldwide, nations pursue SD through diverse strategies, with some employing Big Data and e-government for localized SDG implementation, others wrestling with SDG integration into public policy development, and certain countries opting for "green" investments (EIMassah & Mohieldin, 2020; Allen et al., 2018; Pimonenko et al., 2019, p.44). The discourse on SD dates back to the 1980s with the Brundtland Report, which evolved through global agendas that considered environmental, economic, and social dimensions (Elkington, 1998; Ketola, 1997). Achieving balance among these dimensions remains a complex task for modern society, progressing through phases such as Embryonic, Molding, and Development Periods, culminating in the adoption of 17 SDGs by all UN Member States in 2015, targeting key objectives by 2030 (Shi et al., 2019; Žalėnienė & Pereira, 2021; Leal Filho et al., 2018).

Despite facing criticisms, including the lack of binding commitments and insufficient financing, the SDGs function as a collaborative framework for SD efforts (Espey, 2022; Sachs & Sachs, 2021; Fukuda-Parr & Donald, 2023; Pogge, 2023; Scholte & Söderbaum, 2017; Vandemoortele, 2017; Swain, 2018). Education emerges as a vital component, and Higher Education Institutions (HEIs) play a central role in executing the 2030 Agenda. Scholars emphasize their pivotal role, positioning them as significant influencers and agents of transformation aligned with the SDGs. Recognized for spearheading SD education, HEIs contribute to sustainable skills development, design applied curricula, and cultivate future leaders, significantly impacting the achievement of all 17 SDGs through global community engagement

(Nhamo & Mjimba, 2020; Tilbury, 2011; Leal Filho et al., 2019; Puertas & Marti, 2019; Hallinger & Chatpinyakoo, 2019; Menon & Suresh, 2022).

In pursuing SDGs, HEIs should adopt the concept of sustainable performance (Searcy, 2012), addressing economic, environmental, and social dimensions, measuring adaptability and long-term commitment to SD. Transparent reporting and accountability aid progress assessment and improvement (Dalta & Goyal, 2022), guiding efficient resource allocation for maximum impact (Roos & Guenther, 2020). This approach fosters continuous improvement, enhances reputation, attracts socially responsible stakeholders (Caeiro et al., 2013), and aligns with evolving SDG challenges, meeting stakeholder expectations for a more sustainable global society. Unlike corporate metrics emphasizing external market factors (Hansen & Wernerfelt, 1989), HEIs are predominantly assessed based on academic criteria, centering on teaching and research (King, 2009). Lozano et al. (2013) recommend integrating sustainable action across operations and comprehensive performance measurement involving economic, academic, and sustainable dimensions. For HEIs, sustainable performance encompasses ethically achieving educational, environmental, social, and financial goals, evidenced by initiatives like "being green," recycling programs, and carbon emissions reduction campaigns (Laasch et al., 2020; Kerr & Hart-Steffes, 2012, p. 13).

Historically, university rankings prioritized academic and research reputation, sidelining sustainable considerations (Puertas & Marti, 2019). However, current global challenges highlight the need for sustainable development (SD) action, facing challenges like defining a "good sustainable university," limited visibility of Higher Education Institutions (HEIs) SD actions, and underdeveloped reporting practices (Brusca et al., 2018). Searcy (2012) advocates for a comprehensive indicator system for HEIs to aid decision-makers in addressing sustainable challenges. Participation in global sustainable rankings assesses HEIs' efforts in managing SD actions and classifying their performance (Puertas & Marti, 2019). HEI sustainable rankings go beyond academic assessment, quantifying actions related to the environmental and social spectrum, aligning with the logic of global sustainable rankings (Galleli et al., 2021). In the past decade, various systems emerged for classifying HEIs for SD (Veidemane, 2022). SD assessment tools like AISHE 2.0, STARS, GASU, ASSC, PSIR, SAQ, SustainTool, and UniSAF have been mapped in HEIs (Caeiro et al., 2013). While several international rankings focus on SD-related actions, notable examples

include UI Green Metric and THE Impact Ranking, assessing HEIs globally on contributions to all 17 SDGs, offering transparency on actions and performance related to them (Veidemane, 2022; De la Poza et al., 2021; Galleli et al., 2021).

HEIs, like other organizations, typically function within capitalist systems or mixed economies (Nelson, 2011). The institutions within a country's capitalist systems can either facilitate or hinder SD actions for organizations (Ortas et al., 2019). Previous research has highlighted variations in the sustainable performance of organizations linked to differences in national institutional dimensions (Jackson & Apostolakou, 2010; Kang & Moon, 2012; Duran & Bajo, 2014; Hartmann & Uhlenbruck, 2015; Shahzad et al., 2016; Kyaw et al., 2017; Gallego-Álvarez & Quina-Custodio, 2017). The institutional environment possesses the potential to either enhance or restrict organizations' SD performance (Ortas et al., 2019). Accounting for diverse national characteristics is a valuable guide for higher education policymakers, promoting responsible management and actions supporting SD (Laasch et al., 2020; Wesselink & Osagie, 2020; Adler & Laasch, 2020). Understanding the influence of capitalism on HEIs' sustainable performance in global rankings is fundamental due to variability in national institutional dimensions (Hall & Soskice, 2001). Therefore, comprehending the impact of capitalism and its institutional dimensions on the sustainable performance of HEIs in global sustainable rankings is imperative (Hall & Soskice, 2001).

Hall and Soskice (2001) underscored the necessity of comprehending capitalism's influence on HEIs' sustainable performance in global rankings, considering variations in national institutional dimensions. These dimensions, covering work and industrial relations, finance, relations between HEIs, education, and governance, distinguish between Liberal Market Economies (LME) and Coordinated Market Economies (CME) (Hall & Soskice, 2001). The dualist capitalism's classification is recognized as limited to the scope of the Organization for Economic Cooperation and Development (OECD), particularly relevant in addressing current challenges toward SD through global community engagement (Leal Filho, 2011). In response to this limitation, Witt et al. (2018) introduced nine additional groups, expanding the Varieties of Capitalism (VoC) framework to encompass emerging countries and other relevant players in the global trade scene. These groups include highly coordinated economies (HCE), coordinated market economies (CME), liberal market economies (LME), European peripheral economies (EPE), advanced emerging economies (AEE),

Economies of advanced cities (EAC), Arab oil-based economies (AOE), emerging economies (EME), and socialist economies (SOE) (Witt et al., 2018).

To understand sustainable performance comprehensively in various settings, we refer to the frameworks proposed by Hall and Soskice (2001) and Witt et al. (2018). Despite the extensive research available on this topic, numerous unanswered questions remain regarding the sustainable performance of HEIs participating in global sustainable rankings and the impact of institutional systems on an organization's sustainable actions in different countries. Lauder et al. (2015) highlighted the scarcity of studies on global sustainable rankings in HEIs, prompting further research. Galleli et al. (2021) suggest investigating the influence of universities based on their respective countries' sustainable indexes. Emphasis has been placed on expanding research on sustainable performance to higher levels of analysis, such as countries, economic blocs, and geographic regions. It is recommended to explore emerging markets, including countries in South Asia and South America, considering the mediating effect of national institutional dimensions on sustainable performance, especially in areas like Asia, Latin America, or Europe. These insights highlight the importance of examining the impact of macroeconomic variables, particularly institutional variables, on sustainable performance (Aguinis & Glavas, 2012; Gupta & Gupta, 2020; Ojeyinka & Osinubi, 2022).

From this scenario, this study intends to fill those gaps by addressing HEIs' sustainable performance in global sustainable rankings and their relationship with national institutional dimensions through the theoretical lens of VoC. Based on these, we present the research question: **How is the relationship between the sustainable performance of higher education institutions and national institutional dimensions?**

The study achieves three objectives: identifying components contributing to the sustainable performance of HEIs in global rankings, exploring national institutional dimensions influencing HEIs' sustainable performance, and introducing a framework distinguishing between Ocean Capitalism and Aquarium Capitalism. Ocean Capitalism, aligned with economic freedom and principles of liberal market economies (Hall & Soskice, 2001; Williamson, 1985), offers business opportunities with associated success and risks. In contrast, aquarium capitalism emphasizes stakeholder coordination and aesthetic appeal (Svensson, 2005) and prioritizes harmonious coordination for success. Theoretical contributions enrich SD education

domains with previously absent structured and comprehensive data. The study's novelty is examining HEIs' sustainable performance through the VoC in global rankings, enhancing theoretical understanding. Practically, it provides insights for both public and private HEIs, guiding SD-aligned investments. The study introduces a novel analytical perspective for enhancing HEIs' sustainable rankings, offering governments input for shaping SD-promoting policies. Socially, it challenges the conventional idea of the "best university" in SD, fostering societal debate and legislative adjustments. It aligns directly with SDGs, showing an inverse relationship between SDG rankings and societal indicators such as poverty, gender inequality, hunger, and unemployment.

## 1.1 RESEARCH PURPOSE

**Comprehend the relationship between the sustainable performance of Higher Education Institutions and national institutional dimensions in global sustainable rankings.**

### 1.1.1 Specific Purposes

Following the research objective, the specific purposes are established below:

- a) Identify how the sustainable performance of HEIs behaves over time, considering their countries' respective institutional dimensions.
- b) Identify the components of the sustainable performance of HEIs participating in global sustainable rankings.
- c) Identify the national institutional dimensions that can influence the sustainable performance of HEIs.
- d) Propose a framework to analyze the sustainable performance of HEIs in the different institutional contexts in which they operate.

### 1.1.2 Research Structure

This dissertation consists of six main sections. Following this introduction, the second section presents the theoretical framework, exploring sustainable development, sustainable performance, and the relationship between HEI sustainable performance and VoC in global sustainable rankings. This section also outlines the

developed study hypotheses. The third section details the methodology, encompassing research typology, sample population and definition, data types, analyzed variables, econometric model, and statistical analyses. The fourth section covers the analysis of results, including static and dynamic analysis, and additional tests to enhance study robustness. The fifth section delves into a discussion of these results, exploring each hypothesis. Finally, the sixth section presents the study's conclusion.

## 2 THEORETICAL BACKGROUND

This section delves into the theoretical foundation, commencing with exploring SD and HEI, covering their origins, progress, and contributions. It then discusses sustainable performance, including aspects of global sustainable rankings, perspectives, and emerging trends. Additionally, the literature on VoC and its relationship with SD is examined. Finally, the section develops hypotheses and comprehensively analyses the study constructs.

### 2.1 SUSTAINABLE DEVELOPMENT AND HIGHER EDUCATION INSTITUTIONS

#### 2.1.1 Conceptualizing Sustainable Development

SD has garnered increased global attention, drawing interest from governments, academics, professionals, and international organizations (Olawumi & Chan, 2018). This shift in consciousness signifies a vital transformation in how humanity addresses environmental challenges and socioeconomic issues related to poverty and inequality (Hopwood et al., 2005). Shi et al. (2019) note that SD has evolved through various phases with multiple definitions and interpretations. Categorizing its evolution into three periods—Pre-Stockholm, Stockholm to WCED, and post-WCED—provides insights into its developmental trajectory (Mebratu, 1998; Shi et al., 2019). Since 2015, SD has experienced a significant surge in global attention, leading to a proliferation of scientific publications emphasizing its importance for current and future societies (Grosbeck et al., 2019). The United Nations General Assembly introduced a new global development agenda in 2015, outlining clear targets for SD by 2030, encapsulated in the 17 SDGs (Žalėnienė & Pereira, 2021; Leal Filho et al., 2019).

These SDGs aim to address poverty reduction, environmental protection, and promoting peace and security (Galleli et al., 2021). The UN's comprehensive approach encompasses social, environmental, and economic pillars, garnering widespread political support and inspiring various actors, including governments, non-governmental organizations, educational institutions, and the public. Table 1 consolidates the Timeline of the main events/approaches related to the SD concept.

**Table 1 - Timeline of the concept of Sustainable Development**

Period	Perspective	Year	Main Events/Approaches	Authors
First: Pre-Stockholm or Embryonic Period	Religious beliefs and indigenous traditions	***	Environmentally positive passages in classical texts.	Kinsley (1996) Gottlieb (1996) Turner & Pearce (1990)
	Economics/Scarcity	1794	Publication of Theory of limits. Thomas Robert Malthus (1766-1834).	Oser & Blanchfield (1997)
Second: Stockholm to WCED or Molding Period	Environmental Management	1972	Stockholm Conference.	Meadows et al. (1972).
			Publication of Limits to Growth (1972)	Mesarovic (1974) DuBose et al. (1995)
	Political Economy	1979	Mankind at the Turning Point (1974)	Tryzna & Osborn (1995)
			Publication of Small Is Beautiful.	Schumacher (1979)
			World Conservation Strategy, first use "Sustainable Development."	Mebratu (1998) Shi et al. (2019)
Third: Post-WCED or Developing Period	Conceptual Frame	1980		Brundtland (1987)
	Institutional	1987	Definition of the term SD by WCED in "Our Common Future."	Pearce et al. (1989) WCED (1987)
	Action Plan	1992	UNCED Conference: Rio Conference - Agenda 21	Weiss (1992)
	Battle for political consensus	1994	More than 80 definitions of SD.	Holmberg (1998)
	Organizations/Business	1997	Balances economic, social, and environmental performance.	Elkington (1998) Ketola (1997)
Third: Post-WCED or Developing Period	Systemic and Ethical	2000	Millennium Development Goals (MDGs) were adopted.	Shi et al. (2019)
	Stakeholder Engagement	2007	Engagement of employees, customers, suppliers, and communities.	Greenwood (2007) Boele et al., (2001)
	The social problem: poverty	2012	Rio + 20 UNCED. Declaration "The Future We Want".	Fukuda-Parr (2017) Ogryzek (2023)
	Global Agenda	2015	The UN 2030 Agenda. Call to action to protect the planet, end poverty, and guarantee human well-being by 2030.	Shi et al. (2019)
	Educational	Post-2015	Education is essential for SD and a sustainable future.	UNESCO (2020) Leal Filho et al. (2011) Ramos et al. (2015) Cottafava et al. (2019)

**Source:** Author's work (2024), based on Mebratu (1998) and Shi et al. (2019).

The concept of SD emerges from the pursuit of equilibrium between economic advancement and the increasing recognition of global interconnections linking environmental issues to socioeconomic challenges, such as poverty, social inequality, and concerns for humanity's well-being (Žalėnienė & Pereira, 2021). As a result, the United Nations (UN) issued a global call for SD, emphasizing integration and networks.

This call has become integral to governmental and organizational agendas, with SDGs forming an essential aspect of research institutions' missions worldwide (Shi et al., 2019).

The 17 SDGs constitute a complex and interconnected framework to foster sustainable development worldwide (Fu, 2019). Achieving these goals requires a holistic approach that considers the interrelationships among the goals within and across different geographical areas (Liu et al., 2018). The SDGs offer a potential framework for collaboration and partnership involving the public and private sectors, civil society, and the social work profession (Stansfield, 2017). Higher Education Institutions play a fundamental role in nurturing students and conducting research that can contribute to the objectives of the SDGs (Khalid et al., 2021).

One cluster of SDGs focuses on eradicating poverty and hunger and ensuring health and well-being for all (Fonseca, 2020; Elalfy et al., 2021). These goals, including poverty eradication (SDG 1), health and well-being (SDG 3), and quality education (SDG 4), are closely interconnected and mutually reinforcing (Collier, 2020; Elalfy et al., 2021). SDG 4 particularly emphasizes the importance of quality education in empowering individuals and fostering SD (United Nations, 2015; Elalfy et al., 2021). Additionally, goals related to clean water and sanitation (SDG 6) and affordable and clean energy (SDG 7) underscore the significance of environmental sustainability in broader development objectives (Fonseca, 2020; Mohtar, 2016; Ishatono, 2016; Elalfy et al., 2021).

Environmentally sustainable is emphasized in SDGs related to climate action (SDG 13), life below water (SDG 14), and life on land (SDG 15) (United Nations, 2015; Elalfy et al., 2021). These goals highlight the urgency of addressing climate change, preserving biodiversity, and responsibly managing natural resources (Fonseca, 2020; Mohtar, 2016; Khalid, 2019; Elalfy et al., 2021). Moreover, SDGs related to gender equality (SDG 5), reduced inequalities (SDG 10), and peace, justice, and strong institutions (SDG 16) acknowledge the importance of social equity, inclusion, and good governance in SD efforts (United Nations, 2015; Pandey, 2020; Elalfy et al., 2021). The 17 SDGs collectively reflect a commitment to addressing global challenges and fostering SD worldwide, requiring collaborative efforts across sectors and regions (Fonseca, 2020; United Nations, 2015; Khalid, 2019; Elalfy et al., 2021).

Thus, the progress of SD is intricately tied to collaborative efforts among diverse societal actors, including institutions, governments, and organizations,

particularly HEIs (Leal Filho et al., 2019). The SD concept guiding this study envisions achieving human development inclusively, cohesively, equitably, judiciously, and securely (Gladwin et al., 1995). Organizations play a pivotal role in realizing SD, necessitating their commitment to integrating SD principles into their processes, strategies, and long-term visions to remain successful and competitive (Calabrese et al., 2019). However, incorporating SD into long-term strategies presents challenges, particularly in the context of the COVID-19 pandemic, the Russia-Ukraine war, and growing global tensions, as the modern world operates within nested cycles (Jermolajeva & Trusina, 2022).

The achievement of SDGs faces challenges in the current global context, with a significant concern being the inadequate funding and resources necessary for the 2030 Agenda's ambitious goals (Sachs & Sachs, 2021). Developing countries encounter financial constraints, impeding investments in crucial areas like infrastructure, education, and healthcare outlined by the SDGs (Fukuda-Parr & Donald, 2023). The global economic repercussions of events such as the COVID-19 pandemic exacerbate the strain on resources, diverting attention and funds away from sustainable development efforts (Espey, 2022). Persistent insufficient financing remains a critical obstacle, jeopardizing progress toward SDG achievement.

Another SDG risk is the lack of universal commitment and shared responsibility among nations. The goals require collaborative efforts from governments, businesses, civil society, and individuals worldwide (Kim & Shim, 2022). However, geopolitical tensions, competing national interests, and the absence of a coordinated global approach hinder effective cooperation (Kim & Shim, 2022; Pogge, 2023). Addressing complex issues like climate change, inequality, and poverty necessitates a unified effort, and the lack of international consensus poses a significant risk to the successful implementation of the SDGs (Friedman & Gostin, 2016; Kim & Shim, 2022).

Addressing these challenges necessitates a multifaceted approach (Sachs & Sachs, 2021; Scholte & Söderbaum, 2017). Firstly, there is a need for increased international cooperation and a commitment to shared responsibility (Swain, 2018). Governments, businesses, and civil society must collaborate to overcome geopolitical barriers, fostering an environment conducive to sustainable development initiatives (Swain, 2018). Innovative financing mechanisms and investments from the public and private sectors are pivotal in mobilizing the resources required for SDG implementation (Sachs & Sachs, 2021). Strengthening global governance and accountability

mechanisms is essential to ensure nations fulfill commitments and take meaningful actions toward achieving the SDGs (Scholte & Söderbaum, 2017; Swain, 2018).

Additionally, adapting to evolving challenges and incorporating new technologies and methodologies can enhance the effectiveness of SD efforts (Vandemoortele, 2017). Jansen (2003) emphasizes a comprehensive approach to SD, highlighting the need for a strategic approach to innovation and breakthroughs, focusing on human needs and eco-efficiency. Building resilience and flexibility into strategies can help navigate unexpected disruptions, such as pandemics or economic crises (Fiksel, 2006; Flint, 2010). Continued advocacy, awareness-raising, and education are essential to engage communities and individuals in pursuing sustainable development (Nhamo & Mjimba, 2020). While the challenges are formidable, addressing them with renewed commitment and comprehensive strategies can pave the way for a more sustainable and equitable future (Vandemoortele, 2017; Nhamo & Mjimba, 2020).

In this way of pursuing the SD, despite criticism of the 2030 Agenda, the SDGs have been a global guiding framework for cooperative efforts (Disterheft et al., 2013). Education is crucial in addressing these challenges and cultivating individuals and future leaders who support SD (Menon & Suresh, 2022). UNESCO (2020) emphasizes the need for holistic and transformative education to address the complexities and requirements of SD, encompassing content, learning outcomes, pedagogy, and learning environments.

HEIs, therefore, emerge as pivotal actors, historically leading the creation and deconstruction of knowledge (Tilbury, 2011; Boiocchi et al., 2023). Their significance lies in multifaceted contributions, exemplified by setting sustainable practices, fostering education on sustainable behaviors, discovering new knowledge, and inventing technologies to support SD (Boiocchi et al., 2023). HEIs play a crucial role in navigating the challenges toward SD by developing students' skills for the evolving labor market and responding to the UN's global call for achieving the SDGs (Puertas & Marti, 2019; Leal Filho, 2011; Zanellato & Tiron-Tudor, 2021). HEIs, acknowledging their pivotal role in the SDGs, are identified as significant contributors capable of influencing the achievement of all 17 SDGs (Zanellato & Tiron-Tudor, 2021). The contributions of HEIs to SD extend to engagement with the global community, creating foundations for SDGs through teaching, fulfilling their "third mission," and establishing partnerships (Leal Filho et al., 2019; Ramos et al., 2015; Liu et al., 2019; Lozano et al., 2013).

HEIs contribute further by developing essential SD-related skills in students, discovering new knowledge, educating them about sustainable behaviors, and implementing sustainable curricula (Puertas & Marti, 2019; Boiocchi et al., 2023; Hallinger & Chatpinyakoo, 2019; Menon & Suresh, 2022; Veidemane, 2022). Veidemane (2022) and Leicht et al. (2018) highlight that Education for Sustainable Development (ESD) empowers students through a holistic learning approach to make responsible decisions and actions for environmental integrity and economic viability.

### 2.1.2 HEIs' Contributions to the 2030 Agenda and Sustainable Development

HEIs' commitment to SD extends beyond traditional academic roles, encompassing campus infrastructure improvements and curriculum updates (Atici et al., 2021). Adopting the "green university" concept, incorporating sustainable practices like renewable energy usage, exemplifies HEIs' dedication to SD (Atici et al., 2021; Leal Filho et al., 2019; Lozano et al., 2015). HEIs actively address SD through waste, water, and soil management, promoting sustainable practices and fostering innovation, preparing students for evolving SD dynamics in the job market (Puertas & Marti, 2019; Kerr & Hart-Steffes, 2012).

Beyond intellectual production, HEIs play a crucial role in environmentally conscious practices, preparing the next generation of leaders for energy transition (Nhamo & Mjimba, 2020). Socially, they advocate diversity, equity, and social justice, create inclusive environments, engage with communities, and contribute to social cohesion and well-being (Littledyke et al., 2013). In economic terms, HEIs manage finances responsibly, promote entrepreneurship, and collaborate with organizations for sustainable economic growth (Puertas & Marti, 2019; Nielsen et al., 2020). Traditional university rankings, emphasizing academic performance and research-related indicators, signify global recognition, acknowledging the knowledge produced by HEIs on a world-class scale (King, 2009; Muñoz-Suárez et al., 2020).

There is substantial literature on the SDGs and their fundamental role in society's incorporation of the 17 SDGs. However, understanding how HEIs engage with the SDGs is still incipient (Leal Filho et al., 2019). One way to assess sustainable results and practices at HEIs, to understand their engagement with the SDGs and respond to the pressures related to sustainable in which the educational field is immersed, is participation in university rankings related to the theme. Participating in

university global rankings related to SD is identified as a strategic approach for HEIs to assess and communicate their sustainable results, understand their engagement with SDGs, and contribute to sustainable awareness (Lauder et al., 2015; Shi & Lai, 2013). The participation of HEIs in these rankings is essential to direct the actions of university managers to implement sustainable practices in institutions, both in the integration and institutionalization of these practices (Shi & Lai, 2013).

HEIs play an essential role in contributing to the 2030 Agenda for SD as engines of knowledge generation, innovation, and critical thinking, fostering the intellectual capital needed to address complex global challenges (Leal Filho et al., 2019). HEIs contribute valuable insights and solutions to sustainable development issues through research and development, aligning their efforts with the goals outlined in the 2030 Agenda. Additionally, HEIs serve as platforms for interdisciplinary collaboration, bringing together diverse fields of study to tackle multifaceted problems related to poverty, inequality, environmental degradation, and more (Liu et al., 2019).

Secondly, HEIs are pivotal in educating the next generation of leaders and change-makers who will drive sustainable development efforts forward (Tilbury, 2011). By integrating sustainable development principles into curricula, HEIs cultivate a mindset of responsibility and awareness among students. Graduates are equipped with the knowledge and skills needed to address global challenges in their respective fields, contributing to achieving the Sustainable Development Goals (SDGs) (Puertas & Marti, 2019). HEIs also emphasize the importance of ethical and socially responsible practices, instilling a commitment to sustainability in future professionals and leaders.

Thirdly, HEIs contribute to implementing the 2030 Agenda through community engagement and outreach initiatives. Many institutions actively collaborate with local communities, governments, and non-governmental organizations to address pressing social, economic, and environmental issues at the grassroots level (Leal Filho et al., 2019). This engagement ensures that academic expertise is applied directly to real-world challenges, fostering sustainable development on a local scale. HEIs also serve as hubs for knowledge dissemination, sharing research findings and best practices with the broader community to inspire positive change.

Lastly, HEIs contribute to monitoring and assessing progress toward the SDGs. Through research and evaluation, they provide valuable data and indicators to measure the impact of sustainable development initiatives (Leal Filho et al., 2019). This research-driven approach helps identify areas of success and areas that require

further attention and intervention. By actively participating in the monitoring and reporting processes, HEIs contribute to the transparency and accountability crucial for the successful implementation of the 2030 Agenda and SD at large.

## 2.2 SUSTAINABLE PERFORMANCE IN HIGHER EDUCATION INSTITUTIONS

The exploration of sustainable performance necessitates a nuanced understanding of distinctions among organizational performance, academic performance, and the sustainable performance of HEIs. Based on the traditional economic model (Hansen & Wernerfelt, 1989), organizational performance centers on determining business success through external market factors. Hansen and Wernerfelt (1989) highlight economic and market considerations as primary determinants of organizational success. In contrast, academic performance in HEIs revolves around knowledge creation, encompassing factors like research output, publication metrics, academic honors, and the presence of distinguished researchers or Nobel laureates (Muñoz-Suárez et al., 2020). Global university rankings, such as QS World University Rankings (QS-WUR), Times Higher Education World University Rankings (THE-WUR), and Academic Ranking of World Universities (ARWU), predominantly evaluate these academic aspects, emphasizing teaching quality, prestige, and funding sources (Muñoz-Suárez et al., 2020).

HEIs contribute significantly to SD by addressing economic, environmental, and social dimensions. Beyond academic pursuits, their roles include managing finances responsibly, promoting entrepreneurship, fostering sustainable practices, and engaging with communities (Puertas & Marti, 2019; Nielsen et al., 2020). These multifaceted contributions underline the need to broaden the evaluation of HEIs beyond traditional academic metrics to encompass sustainable performance indicators that align with contemporary global challenges.

As Searcy (2012) advocates, sustainable performance requires a comprehensive approach that addresses an organization's economic, environmental, and social objectives. Lozano et al. (2015) emphasize the importance of sustainable practices across various organizational levels, including operations, dissemination, collaboration, institutional structure, training, research, evaluation, and reporting, involving diverse stakeholders. In HEIs, sustainable performance encompasses ethical and responsible achievement of academic, environmental, social, and economic goals

(Searcy, 2012; Laasch et al., 2020). HEIs play a vital role in environmentally conscious practices, social inclusivity, and long-term economic viability, aligning with their educational purpose (Weissman, 2012; Littledyke et al., 2013; Puertas & Marti, 2019; Nielsen et al., 2020). Consequently, there is a need to broaden the evaluative focus on HEIs to incorporate these three dimensions of sustainable development beyond intellectual production.

Environmentally, HEIs are crucial in nurturing the next generation of leaders and advancing the technology required to realize climate reduction goals (Kerr & Hart-Steffes, 2012). Initiatives such as promoting "being green," organizing eco-friendly contests, and benchmarking recycling programs among participating HEIs showcase their commitment to SD. Additionally, HEIs engage in global campaigns, collaborating with young leaders to spearhead movements addressing the climate crisis, focusing on reducing carbon emissions (Kerr & Hart-Steffes, 2012).

Socially, championing diversity, equity, and social justice fosters inclusive and supportive work and learning environments (Littledyke et al., 2013). Their engagement with communities promotes greater social cohesion and aims to enhance overall well-being and reduce environmental impact (Jackson, 2016). In this manner, HEIs play a pivotal role in shaping the development of future generations by actively contributing to societal advancement.

Economically, responsibly managing financial resources (Laasch et al., 2020) and fostering entrepreneurship and innovation aligned with sustainable development goals (Avrampou et al., 2019; Dahlmann et al., 2019). Studies emphasize the significance of such initiatives and explore how companies can contribute to financing sustainable development (Etzion et al., 2019; Schramade, 2017). Additionally, HEIs collaborate with other organizations to actively promote sustainable economic development, showcasing their integral role in advancing the economic aspects of SD (Leal Filho et al., 2019).

Searcy (2012) proposes a system of indicators for HEIs to measure their progress in favor of SD. It offers comprehensive information to support management, control, planning, and the performance of short and long-term economic, environmental, and social activities. These indicators enable decision-makers to address sustainable challenges by enhancing their understanding of the current situation, direction, and desired end state (Searcy, 2012). Robust, sustainable performance, guided by these indicators, can position HEIs as exemplars of

sustainable practices, fostering a culture focused on SD (Boiocchi et al., 2023). Additionally, publishing sustainable reports by HEIs can attract financial resources from investors interested in supporting institutions with a solid commitment to sustainable development (Muñoz-Suárez et al., 2020). However, challenges persist, including the absence of a consensus on defining a "good sustainable university," limited publicity of HEIs' sustainable actions, and the nascent stage of sustainable reporting in the higher education sector (Brusca et al., 2018; Parisi, 2013).

Given these challenges, an alternative method for assessing HEIs' actions favoring SD is their participation in global sustainable rankings. Although various assessment tools exist for SD in HEIs, such as AISHE 2.0, STARS, GASU, ASSC, PSIR, SAQ, SustainTool, and UniSAF, international rankings dedicated to measuring SD-related actions are limited. Among them, THE Impact Ranking stands out, covering all SDGs and serving as a focal point of analysis in this dissertation (Veidemane, 2022; Caeiro et al., 2013).

### 2.2.1 An Overview of Global Sustainable University Rankings

Global education rankings have played a crucial role in the competitive landscape of HEIs, shaping their reputation and attracting students and funders (De la Poza et al., 2021). These rankings' ascending classification, quartile, and trend influence various stakeholders, including students, researchers, university leaders, capital funds, and politicians (De la Poza et al., 2021). However, Puertas and Marti (2019) note that traditional rankings have focused on academic and research reputation, with limited attention to SD concerns.

Traditionally, HEIs are compared based on educational performance in rankings, but there is a growing recognition of the importance of considering SD in this context (Galleli et al., 2021). Sustainable rankings become crucial tools to assess and quantify HEIs' actions related to the environmental and social spectrum (Galleli et al., 2021). According to Puertas and Marti (2019), participating in sustainable rankings is a means to evaluate the intensity of HEI efforts in managing SD-oriented actions. Notably, the Times Higher Education Impact Rankings (THE) is considered in this study due to its global coverage and transparency in revealing HEIs' activities related to SDGs (Atici et al., 2021; De la Poza et al., 2021).

Global sustainable rankings are valuable tools for HEIs to assess their performance concerning SD, compare themselves with benchmarks, and comprehend existing differences (De la Poza et al., 2021). This aspect, corroborated by Atici et al. (2021), indicates that securing a top position in these rankings enables HEIs to gain a competitive advantage. Consequently, these rankings are increasingly essential for the strategic management of HEIs. Another emerging trend is the development of local rankings within countries, requiring the identification of internationally comparable SD indicators—a significant challenge (Veidemane, 2022). Atici et al. (2021) emphasize that sustainable performance at the country level positively impacts the academic performance of HEIs.

As global rankings become integral for strategic planning, HEIs can enhance the integration of SDGs across various university core areas. Given the worldwide nature of these rankings and the diverse characteristics of each country influencing SDG implementation, rankings can aid policymakers in formulating higher education policies by providing SD guidelines for HEIs to align efforts toward sustainable development.

Finally, global sustainable rankings tend to capture the varieties of management reorientation paradigms within HEIs, providing legitimate alternatives to responsible management practices (Laasch et al., 2020). HEIs are evolving into alternative management structures, adopting ethical management, CSR management, responsible leadership, responsible governance, and sustainable management, all contributing to responsible management and actions favoring SD (Laasch et al., 2020; Constantinescu & Kaptein, 2020; Adler & Laasch, 2020; Cockburn et al., 2015).

### 2.3 VARIETIES OF CAPITALISM

The Varieties of Capitalism (VoC) approach, established in the late 1990s, seeks to elucidate institutional variations among countries based on their capitalist relations (Gallego-Álvarez & Quina-Custodio, 2017). This framework delves into how organizations navigate within the distinct institutional structures of each country, resulting in diverse responses and coordination mechanisms in areas like industrial relations, labor relations, unions, and corporate governance (Benney, 2021; Hall & Soskice, 2001). Initially identifying two capitalism types, Liberal Market Economies (LME) exemplified by countries like the United States and the United Kingdom and

Coordinated Market Economies (CME) represented by Japan and Germany, Hall and Soskice (2001) depict LMEs with competitive relations, short-term employment prevalence, and a financial system based on the stock exchange market. Conversely, CMEs exhibit consensual relationships with cooperative industry alliances, relying on large banks and dispersed governance (Hall & Soskice, 2001; Benney, 2021).

The VoC theory underscores diverse institutional forces, emphasizing historical pathways and national arrangements (Hall & Soskice, 2001). Scholars recognize the impact of countries' institutional variables on organizational strategy performance (Wan & Hoskisson, 2003). Critical institutional factors like financial and educational systems, public policy, and training systems significantly influence organizational strategic performance (Alam et al., 2019). Despite its widespread use in comparing institutional environments, the VoC approach faces criticism for neglecting non-OECD economies (Kiran, 2018; Schneider, 2009). Witt et al. (2018) addressed this limitation by categorizing 61 major economies into nine groups, accounting for institutional particularities and including emerging countries disregarded in the initial VoC approach. These include highly coordinated economies (HCE), coordinated market economies (CME), liberal market economies (LME), European peripheral economies (EPE), advanced emerging economies (AEE), economies of developed cities (EAC), Arab oil-based economies (AOE), emerging economies (EME), and socialist economies (SOE).

Both Hall & Soskice (2001) and Witt et al. (2018) examine national dimensions like labor and industrial relations, finance, inter-company relations, education, and governance to delineate the institutional environment of each country, elucidating the complex economic and political systems influencing organizations' sustainable development (SD) practices. The VoC approach underscores the institutional factors preserving diversity, highlighting the significance of historical trajectories and unique national arrangements (Hall, 1986; Lane, 1995; Whitley, 1998). Streeck (2000) argues that economic globalization and international trade contribute to national diversity by fostering specialization, offering insights into globalization beyond conventional strategic choices in business literature (Hall & Soskice, 2001). Table 2 summarizes the distinguishing characteristics of each VoC cluster.

**Table 2 – Main characteristics of VoC cluster**

Clusters	Characteristics	Previous Studies
Liberal Market Economies (LME)	Market-Based Coordination, Decentralized Decision-Making, Emphasis on Competition, Flexible Labor Markets, Limited Government Intervention, Emphasis on Private Ownership, Financial Market Orientation, Focus on Shareholder Value, Dynamic and Adaptive Nature	Hall & Soskice, (2001); Hall & Thelen, (2009); Hall & Gingerich, (2009); Friedman, (2016); Sowell, (2014)
Coordinated Market Economies (CME)	Collaborative Industrial Relations, Inclusive Decision-Making Processes, Vocational Training and Skill Development, Bank-Centered Financial Systems, Long-Term Employment Relationships, Emphasis on Social Welfare, Technological Innovation through Collaboration, Conservative Approach to Risk	Hall & Soskice, (2001); Hall & Gingerich, (2009); Estevez-Abe, (2001); Streeck, (2014); Amable, (2003)
Advanced Emerging Economies (AEE)	High Economic Growth, Diversified Economic Structure, Technological Advancements, Urbanization, Rising Middle Class, Global Integration, Infrastructure Development, Social Progress	Witt et al. (2018); Rajan, (2006); Rodrik, (2011)
Arab Oil-Based Economies (AOE)	Heavy Reliance on Oil Exports, Vulnerability to Oil Price Volatility, Government Dominance in the Economy, Sovereign Wealth Funds, Limited Economic Diversification, Public Sector Employment, Infrastructure Development, Social Welfare Programs	Witt et al. (2018); Baldini (2018); Taha (2023)
Economies of Advanced Cities (EAC)	Global Financial Hubs, Open Economies, Strong Rule of Law, Strategic Geographical Locations, Innovation and Technology, High Standard of Living, Efficient Governance	Witt et al. (2018); Enright, (2003); Siu & Wong, (2004); Low, (2001)
Emerging Economies (EME)	Rapid Economic Growth, Industrialization and Diversification, Urbanization, Globalization and Trade, Technological Advancements, Foreign Direct Investment (FDI), Improving Standards of Living, Financial Market Development, Social and Demographic Changes, Income Inequality	Witt et al. (2018); Rajan, (2006); Rodrik, (2011); Jensen & Berg (2012); Collier, (2018); Prasad, (2009)
European Peripheral Economies (EPE)	Lower Economic Development, Higher Unemployment Rates, Reliance on Agriculture, Structural Weaknesses, Debt Challenges, Less Diversified Economies, Limited Access to Financial Markets, Regional Disparities, Dependency on Core Economies, Policy Challenges	Witt et al. (2018); Eichengreen, (2019); Rodrik, (2011); Jensen & Berg (2012);
Highly Coordinated Economies (HCE)	Strategic Industrial Policy, Long-Term Planning, Close Collaboration Between Government and Business, Lifetime Employment Practices, Strong Emphasis on Education and Skill Development, Keiretsu System, Consensus Decision-Making, Innovation and Technology Leadership, Social Harmony and Cohesion, Strong Emphasis on Quality	Witt et al. (2018); Streeck, (2014); Yamamura (2018); Aoki, (2007)
Socialist Economies (SOE)	Public Ownership of Means of Production, Central Planning, Redistribution of Wealth, Social Welfare Programs, Price Controls, State Intervention in Markets, Collective Bargaining and Workers' Rights, Emphasis on Social Equality, Limited Role of Market Forces, State-Driven Industrialization	Witt et al. (2018); Polanyi, (2002); Kalecki, (2013)

**Source:** Author's work (2024) based on Hall & Soskice, 2001 and Witt et al., 2018.

The fundamental characteristics outlined above broadly capture the VoC clusters. However, it's essential to acknowledge variations among countries following this economic model, and economic systems may exhibit elements from multiple models. Numerous studies have leveraged the VoC framework to investigate its influence on sustainability performance. Hall & Gingerich (2009) discovered that institutional complementarities across diverse spheres of the political economy significantly impact growth rates. Dincer & Dincer (2023) and Lin & Qamruzzaman (2023) both highlighted the positive effects of sustainable reporting and environmental disclosure on firm performance, with Dincer & Dincer (2023) specifically identifying a significant positive correlation between sustainable reporting and financial performance. Lin & Qamruzzaman (2023) further emphasized the role of good governance in ensuring SD. Applying the framework in Supply Chain Management, Hadi et al. (2023) assess the sustainable performance of organizations. These collective findings underscore the role of institutional factors in shaping sustainable performance across various VoC clusters.

In Witt et al.'s (2018) cluster classification, we found socialist economies represented by Cuba (unavailable) and Venezuela (2). Although Cuba and Venezuela adopt socialist systems, the classification proposed by Witt et al. (2018) categorizes them as "Socialist Economies - SOE" due to their active participation in commercial transactions on the global stage. This approach highlights that even countries initially identified as socialist that are considered "socialist economies" engage in commercial activities on an international scale. This distinction in the classification of varieties of capitalism, as developed by Hall & Soskice (2001) and later expanded by Witt et al. (2018), reflects the need to consider the participation of these socialist countries in global trade. Therefore, the classification of VoC is not only limited to countries that traditionally adopt capitalist systems but also encompasses those with socialist orientations that actively participate in the global economy, as indicated by the analysis of Witt et al. (2018).

### 2.3.1 Variety of Capitalism and Sustainable Development

In examining the global perspective of SD within the VoC framework, the impact of SD is acknowledged worldwide (Žalėnienė & Pereira, 2021) and has a widespread impact (ElMassah & Mohieldin, 2020). Actions taken by individual

countries concerning SD carry significant relevance, influencing local and global contexts (Garcia-Sanchez et al., 2016). Despite numerous studies analyzing factors contributing to sustainable reports in various countries, the literature lacks extensive exploration of the impact of countries' institutional characteristics on SD actions (Gallego-Álvarez & Quina-Custodio, 2017). HEIs' practices related to the SDGs and their performance in sustainable rankings are influenced by the institutional environment, as noted by Jackson and Deeg (2008).

The literature underscores the significance of evidence concerning Sustainable Development (SD) actions, particularly in analyzing multiple countries (Garcia-Sanchez et al., 2016). Gallego-Álvarez and Quina-Custodio (2017) point out that prior studies often concentrated on a limited number of countries, overlooking aspects of national institutions within a country's macroeconomic, legal, and political context. Additionally, the institutional environment plays a pivotal role in shaping the practices adopted by organizations, including Higher Education Institutions (HEIs), regarding the SDGs (Jackson & Deeg, 2008). This understanding considers five dimensions: labor and industrial relations, finance, intercompany relations, education, and governance (Hall & Soskice, 2001). Grosvold and Brammer (2011) argue that distinct institutional characteristics in various countries constitute specific economic and political systems. Therefore, from the Varieties of Capitalism (VoC) perspective, the institutional conditions influencing HEIs' actions toward SD may vary across countries and over time, highlighting the imperative for a comprehensive analysis of multiple countries to identify the institutional dimensions impacting HEIs' Sustainable Development actions.

## 2.4 HYPOTHESES DEVELOPMENT

### 2.4.1 Hypotheses Development based on VoC

The Varieties of Capitalism approach, as outlined by Hall and Soskice (2001), encompasses five fundamental dimensions: (1) labor and industrial relations, (2) finance, (3) inter-company relations, (4) vocational education and training, and (5) governance. Within each dimension, the functioning of capitalism necessitates organizations to cultivate relationships for resolving coordination challenges intrinsic to their core competencies. The subsequent presentation will delve into the five

dimensions of the Varieties of Capitalism, supported by arguments and empirical works that underpin the research hypotheses.

#### 2.4.1.1 Labor and industrial relations

In the labor dimension, Hall and Soskice (2001) stress the importance of organizations cultivating essential competencies or dynamic capabilities involving the effective creation, production, and efficient distribution of goods and services, encompassing all organizational tasks engaging the labor force—the quality of internal relationships with the workforce (Baldini et al., 2018). Labor relations in countries with coordinated market economies typically involve more vital unions, greater worker protections, and long-term contracts, influencing actions related to sustainable development. The country's labor system becomes a relevant institutional factor impacting SD initiatives (Witt et al., 2018; Jensen & Berg, 2012).

HEIs actively contribute to SD through actions such as teaching and many others that involve the workforce. Thus, having quality internal relationships can contribute to achieving better sustainable performance in global rankings. Studies suggest that robust worker protections across countries lead HEIs to provide more meaningful social support, attract qualified individuals, and promote an environment conducive to sustainable performance (Baldini et al., 2018; Jensen & Berg, 2012), aligning with Hall and Soskice (2001) emphasize American employers seeking labor cooperation.

*H1: Greater cooperation between employees and employers positively influences the sustainable performance of HEIs in global sustainable rankings.*

#### 2.4.1.2 Finance

The financial dimension is tied to a country's economic freedom, with the government's role in a free economic society being to protect private property and enforce contracts (De Haan & Sturm, 2000). Coordinated market economies, highly coordinated economies, and peripheral European economies operate under specific non-market institutions, influencing interaction processes characterized by robust banking systems, high savings rates, and economic stability (Ahrens et al., 2015;

Benney, 2021). Continental European countries generally have less economic freedom than liberal market economies and advanced city economies like the United States, Canada, and the United Kingdom (Witt & Jackson, 2016).

Economic freedom is positively associated with global prosperity and a country's growth rate, reflecting economic development (Faria & Montesinos, 2009). The market capitalization of national companies is an indicator of economic freedom in countries (Ersin, 2020). Market value, which represents the total value of shares outstanding in publicly traded companies, is calculated by multiplying the share price by the number of shares outstanding. Concerning global financial relations, international cross-listing of companies can improve the development of the national stock market by increasing information transparency. Still, its impact varies based on market size and levels of national transparency (Hargis & Ramanlal, 1998). Countries with greater economic freedom and market-oriented economies tend to have greater market capitalization, cleaner environments, and economic growth (Mitchell, 2013; Doucouliagos & Ulubasoglu, 2006).

Social market economies, exemplified by Germany and the Netherlands, foster robust employer-employee partnerships, emphasizing long-term employment and skill development. This emphasis leads to lower scores on the economic freedom index, reflecting their focus on social protections and collective bargaining agreements (Hassel et al., 2020). Conversely, liberal market economies, represented by the United States and Australia, prioritize individualism and flexibility, resulting in higher economic freedom but contributing to challenges such as income inequality and job insecurity (Hall & Soskice, 2001; Rodrik, 2018).

East Asian developmental states, including Japan and South Korea, exhibit a distinctive blend of state intervention and coordination between government and industry, contributing to economic success while displaying diverse levels of economic freedom (Amsden, 1989; Wade, 2018). Understanding these relationships provides insights into the diverse economic consequences associated with different VoC's clusters and their impact on the economic freedom index. In this context, our investigation delves into the correlation between a country's economic freedom index and the sustainable performance of HEIs. Recognizing the importance of economic freedom as one of the constituent elements in the analytical framework for assessing the sustainable performance of HEIs in global sustainable rankings is paramount.

HEIs operate within the economic context of their respective countries (Witt & Jackson, 2016). Previous research indicates that organizations situated in nations with higher levels of economic freedom tend to exhibit superior sustainable performance (Mitchell, 2013; Ersin, 2020; Benney, 2021). Given this, by using market capitalization data from the World Bank (World Bank, 2023), our objective is to understand the relationship between market capitalization and the sustainable performance of HEIs in global sustainable rankings. Therefore, it can be inferred that HEIs are likely to achieve higher rankings in global sustainable assessments when located in countries with greater economic freedom.

*H2: The country's greater economic freedom positively influences the performance of HEIs in the global sustainable rankings.*

#### 2.4.1.3 Inter-company relations

The intercompany relations dimension relates to local competition among organizations. Countries with higher levels of local competition among organizations often experience enhanced performance in sustainable actions (Charnovitz, 2013; Lopes, 2022; Horen, 2018). Increased competition serves as a driving force for organizations to differentiate themselves by adopting and showcasing sustainable practices (Lopes, 2022). In a competitive environment, businesses must innovate and integrate sustainability into their operations to attract environmentally conscious consumers, gain a competitive edge, and ensure long-term viability (Crowley, 2017).

Coordinated economies, highly coordinated economies, and peripheral European economies foster cooperative relationships among HEIs through strategic alliances, strong union presence, improved working conditions, and flexible agreements, contributing to more robust SD actions (Benney, 2021). Existing studies highlight the positive influence of unions on actions related to SD (Ioannou & Serafeim, 2012; Jensen & Berg, 2012). According to Friedman (2016), a competitive environment encourages businesses, including HEIs, to engage in non-financial matters, such as sustainable actions. This is further corroborated by findings that competitive advantage, an essential aspect of strategic management, positively influences the performance of HEIs (Salvador, 2013; Valerievich & Pavlovna, 2016).

Thus, the number of businesses can demonstrate a competitive environment between organizations, which is reflected in the distribution of market shares, growth rates and profitability of these organizations (Zhang, 2019; Ceptureanu, 2016). This data helps discern trends in a competitive environment, company concentration, and new business growth rates in national economies on a global scale (Klapper et al., 2010; Ghosh et al., 2023). Studies by Porter and Linde (1995) suggest that competitive pressure fosters a business environment conducive to environmental innovation and responsibility. Therefore, a heightened sense of local competition stimulates organizations to prioritize sustainability initiatives, contributing to improved overall sustainability performance within a country (Yalabik, 2011; Dai, 2015). Consequently, more competitive environments are expected to influence the sustainable performance of HEIs in sustainable rankings positively.

*H3: Greater local competition among HEIs in the country positively influences their sustainable performance in global sustainable rankings.*

#### 2.4.1.4 Vocational education and training

Education is another dimension within the VoC framework (Hall & Soskice, 2001). The pattern of human development, particularly an education system, can elucidate variations in SD levels among countries (Lima et al., 2021). In terms of education, health, and income, less developed societies tend to have lower expectations regarding actions favoring SD (Jensen & Berg, 2012). Coordinated economies, highly coordinated economies, European economies, liberal economies, and advanced city economies typically possess well-developed educational systems (Witt et al., 2018).

Recognized as a key driver of economic progress and social development (Khurana, 2014; Ozturk, 2008), formal education is crucial in national development, exemplified by the Asian Tigers' significant investment in education, contributing to their rapid economic growth (Witt & Redding, 2013). Consequently, the indicator of expenditure on education over GDP emerges as a significant measure of national development progress, emphasizing the pivotal role of education in propelling economic growth and social development.

HEIs play a crucial role in spearheading SD education and creating transformative conditions, as highlighted by Mader & Rammel (2015). Their commitment to SD is demonstrated through the establishment of exemplary models, forging partnerships, and engaging the global community in SDGs (Boiocchi et al., 2023; Leal Filho et al., 2019). Notably, HEIs contribute significantly to sustainable skills development for students entering the job market (Puertas & Marti, 2019), design applied curricula to instill SD attitudes (Hallinger & Chatpinyakoo, 2019), and cultivate future leaders capable of supporting the SDGs (Menon & Suresh, 2022). This proactive involvement in preparing individuals for the job market and instilling sustainable attitudes underscores HEIs' pivotal role in forming professionals who contribute to the achievement of all 17 SDGs in response to the UN's call (Leal Filho, 2011). Consequently, human development is anticipated to impact the sustainable performance of HEIs in sustainable rankings positively.

H4: A country's higher level of human development positively influences the sustainable performance of HEIs in the sustainable rankings.

#### 2.4.1.5 Governance

Governance is characterized by formal regulations, corruption control, and law enforcement (Allen & Aldred, 2011). Organizations in coordinated economies (CME), highly coordinated economies (HCE), and European peripheral economies (EPE) exhibit dispersed governance, with ownership spread among a diverse range of shareholders and institutional investors (Farkas, 2019). In contrast, organizations in liberal economies, advanced emerging economies, and advanced urban economies have concentrated governance, with ownership centered among households, banks, and corporations (Benney, 2021; Witt et al., 2018).

Governance, including government stability, state transparency, and practical law implementation, plays a significant role in influencing the sustainable performance of HEIs in sustainable rankings (Coluccia et al., 2018). Government involvement in shaping national characteristics to foster ethical behavior within HEIs is multifaceted. The World Governance Index (WGI) is a comprehensive metric for assessing national governance, incorporating six vital indicators outlined by Kaufmann et al. (2011). These indicators, including Voice and Accountability, Political Stability, Government

Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption, significantly influence developmental outcomes (Kaufmann et al., 1999).

Specifically, Government Effectiveness, Political Stability, Control of Corruption, and Regulatory Quality are paramount in shaping human development trajectories (Ahmad & Saleem, 2014). The WGI's utility extends beyond mere measurement, offering a platform for cross-country comparisons and longitudinal tracking to facilitate governance enhancement efforts (Kaufmann et al., 2009). Good governance is widely acknowledged as pivotal for economic advancement, with democracy, property rights, and adherence to the rule of law as fundamental pillars (Sharma, 2007). Nevertheless, measuring governance indicators presents methodological challenges that complicate the understanding of their impact (Sundaram, 2012).

Despite these complexities, the influence of governance on human development remains discernible, with key factors such as government effectiveness, political stability, control of corruption and regulatory quality significantly shaping developmental trajectories (Ahmad & Saleem, 2014). Countries with robust national governance structures tend to foster better sustainable performance among organizations than those with poor national governance (Swanson & Pintér, 2007; Leal Filho et al., 2016; Akkucuk, 2019). Governance, including government stability, state transparency, and practical law implementation, plays a significant role in influencing the sustainable performance of HEIs in sustainable rankings (Coluccia et al., 2018).

*H5: A better governance environment in the country positively influences the sustainable performance of HEIs in the sustainable rankings.*

In the upcoming section, we will outline the methodological procedures applied in this study. This section will include details about the sample, the analyzed time frame, the identification of study variables, and the statistical techniques employed for data analysis.

### 3 METODOLOGICAL PROCEDURES

This chapter outlines the methodological procedures employed to address our research question and elucidates the epistemological, ontological, and logical assumptions guiding this dissertation. We also illustrate the evaluation of methodological rigor, aligning with widely accepted scholarly standards that correspond to our underlying assumptions.

#### 3.1 RESEARCH TYPOLOGY

This study adopts a descriptive approach to measuring and gathering information on the characteristics, properties, and behaviors of HEIs' sustainable performance, drawing on Sampieri et al. (2013). It also assumes an explanatory nature, aiming to identify variables that may influence the level of sustainable performance of HEIs in global sustainable rankings. The research employs a hypothetical deductive method, grounded in Popper's (2005) epistemological framework, involving the selection of hypothetical propositions to address specific knowledge gaps.

The research applies two techniques - static and dynamic models - aiming for robust and comparable results. The static model involves a panel with fixed effects, incorporating descriptive statistics, inferential statistics, and regression analysis. The dynamic model employs the panel linear model (PLM) estimation technique (Hair Jr et al., 2019; Pindado & Requejo, 2015). The chosen methodology, favored over alternatives like descriptive statistics and ordinary least squares, offers advantages such as unbiased estimates in the presence of missing variables, consistent appraisals in the face of measurement error, and overcoming endogeneity and non-normality challenges in the data (Sampieri et al., 2013; Hair Jr et al., 2019; Pindado & Requejo, 2015).

#### 3.2 POPULATION AND SAMPLE

The investigation spans data from 102 countries, covering 2019 to 2023 and drawing from THE-WUR global sustainable ranking. It encompasses 3,749 HEIs across continents, excluding Antarctica. Table 3 comprehensively overviews all countries and their respective Gross Domestic Products (GDPs).

**Table 3 - Sample of analyzed countries and world GDP**

Country	GDP 2021	World GDP 2021	Countries GDP	%
United States	23,315,080,560,000	96,527,425,918,257	90,534,699,074,741	93.79%
China	17,734,062,645,371			
Japan	4,940,877,780,755			
Germany	4,259,934,911,821			
India	3,176,295,065,497			
United Kingdom	3,131,377,762,926			
France	2,957,879,759,263			
Italy	2,107,702,842,669			
Canada	1,988,336,331,717			
South Korea	1,810,955,871,381			
Russia	1,778,782,625,793			
Brazil	1,608,981,456,325			
Australia	1,552,667,363,236			
Spain	1,427,380,681,294			
Mexico	1,272,839,334,119			
Indonesia	1,186,092,991,320			
Netherlands	1,012,846,760,976			
Saudi Arabia	833,541,236,569			
Turkey	819,035,182,929			
Switzerland	800,640,155,387			
Poland	679,444,832,854			
Sweden	635,663,801,201			
Belgium	594,104,177,539			
Thailand	505,947,037,098			
Ireland	504,182,603,275			
Israel	488,526,545,878			
Argentina	487,227,339,102			
Norway	482,174,854,482			
Austria	480,368,403,893			
Nigeria	440,833,583,992			
South Africa	419,015,018,371			
Bangladesh	416,264,942,893			
United Arab Emirates	415,021,590,683			
Egypt	404,142,766,093			
Denmark	398,303,272,764			
Philippines	394,086,401,171			
Malaysia	372,980,957,208			
Hong Kong	369,176,400,967			
Vietnam	366,137,590,600			
Pakistan	348,262,544,719			
Chile	317,058,508,651			
Colombia	314,464,137,241			
Finland	297,301,883,523			
Romania	284,087,563,695			
Czech Republic	281,777,887,121			
Portugal	253,663,144,586			
New Zealand	249,885,687,029			
Peru	223,249,497,500			
Greece	214,873,879,833			
Ukraine	200,085,537,744			
Kazakhstan	197,112,255,360			
Hungary	181,848,022,233			
Qatar	179,677,211,793			
Algeria	163,044,443,983			
Morocco	142,866,329,198			
Slovakia	116,527,101,097			
Taiwan	Not Available			
Singapore	Not Available			
Kuwait	Not Available			
Cuba	Not Available			
Venezuela	Not Available			

**Source:** The author's work (2024), based on Witt et al. (2018) and World Bank (2023)

Table 4 provides a comprehensive overview of all the HEIs studied by country.

**Table 4 - Number of HEIs by country**

Country	Number of HEIs	Relative Percentage	Cumulative Percentage
Japan	262	6,99%	6,99%
Russian Federation	230	6,13%	13,12%
United Kingdom	220	5,87%	18,99%
United States	185	4,93%	23,93%
Turkey	183	4,88%	28,81%
Spain	176	4,69%	33,50%
India	166	4,43%	37,93%
Taiwan	153	4,08%	42,01%
Brazil	148	3,95%	45,96%
Pakistan	134	3,57%	49,53%
Egypt	123	3,28%	52,81%
Australia	110	2,93%	55,75%
Thailand	104	2,77%	58,52%
Canada	101	2,69%	61,22%
Malaysia	84	2,24%	63,46%
France	83	2,21%	65,67%
South Korea	76	2,03%	67,70%
Chile	75	2,00%	69,70%
Indonesia	73	1,95%	71,65%
Italy	73	1,95%	73,59%
Mexico	68	1,81%	75,41%
Colombia	62	1,65%	77,06%
Saudi Arabia	58	1,55%	78,61%
Portugal	51	1,36%	79,97%
Ireland	43	1,15%	81,11%
China	39	1,04%	82,16%
Poland	39	1,04%	83,20%
Ukraine	37	0,99%	84,18%
Finland	35	0,93%	85,12%
New Zealand	34	0,91%	86,02%
Romania	34	0,91%	86,93%
Philippines	33	0,88%	87,81%
Bangladesh	31	0,83%	88,64%
Greece	30	0,80%	89,44%
Peru	30	0,80%	90,24%
Hungary	27	0,72%	90,96%
Czech Republic	26	0,69%	91,65%
South Africa	26	0,69%	92,34%
Germany	25	0,67%	93,01%
United Arab Emirates	25	0,67%	93,68%
Netherlands	23	0,61%	94,29%
Vietnam	22	0,59%	94,88%
Morocco	20	0,53%	95,41%
Kazakhstan	18	0,48%	95,89%
Nigeria	18	0,48%	96,37%
Switzerland	18	0,48%	96,85%
Sweden	16	0,43%	97,28%
Hong Kong	15	0,40%	97,68%
Slovakia	14	0,37%	98,05%
Algeria	13	0,35%	98,40%
Belgium	10	0,27%	98,67%
Denmark	10	0,27%	98,93%
Kuwait	9	0,24%	99,17%
Argentina	8	0,21%	99,39%
Israel	6	0,16%	99,55%
Austria	5	0,13%	99,68%
Norway	5	0,13%	99,81%
Qatar	5	0,13%	99,95%
Venezuela	2	0,05%	100,00%

**Source:** The author's work (2024).

In table 3, these countries collectively represent 93.79% of the world GDP in 2021, as reported by the World Bank in 2023. While acknowledging the coverage falls short of 100%, an improbable achievement, the study anticipates that akin to a precisely calibrated laser sight at 93.79%, the results will offer a highly reasonable approximation of the intended target. The country selection is based on data availability in THE-WUR ranking, aligning with the studies by Hall & Soskice (2001) and Witt et al.'s (2018) clusters. Initially identifying 61 countries, the analysis focuses on 59 economies categorized into nine Varieties of Capitalism (VoCs), excluding Cuba and Singapore, due to the absence of HEI information in THE ranking.

Notably, in Table 4, Japan, Russia, the United Kingdom, and the United States comprise nearly 25% of the HEI's sample, with emergent and liberal market economies constituting over 57% of the model. We assess HEI's sustainable performance using THE Impact Ranking, as explained in the dependent variable section. The selected timeframe of 2019 to 2023 is strategic, corresponds to the ranking's initial publication in 2019 and aligns with the unprecedented challenges posed by the COVID-19 pandemic. This period captures the global disruptions faced by HEIs, necessitating adaptive measures to mitigate school dropouts and learning setbacks. The 59 economies, classified into nine VoCs, are outlined along with the respective quantity of HEIs in each country, as shown in parentheses.

Table 5 outlines the country clusters according to VoC, as per Witt et al. (2018). This classification serves as a foundational reference for the study, offering a basis for cross-country comparisons within the analysis framework of HEIs. By delving into these clusters, the research aims to enhance comprehension regarding the influence of national institutional dimensions, including economic outcomes like comparative advantage, growth, or inequality, on the sustainable performance of HEIs in global sustainable rankings.

**Table 5 - Clusters of countries among the world's 61 major economies**

Socialist Economies (SOE)	Emerging Economies (EME)	Arab Oil-Based Economies (AOE)	Economies Of Advanced Cities (EAC)	Advanced Emerging Economies (AEE)	European Peripheral Economies (EPE)	Liberal Market Economies (LME)	Coordinated Market Economies (CME)	Highly Coordinated Economies (HCE)
Cuba	Algeria	Kuwait	Hong Kong	Chile	Czech Rep	Australia	Austria	Japan
Venezuela	Argentina	Qatar	Singapore	Israel	France	Canada	Belgium	
	Bangladesh	Saudi Arabia		South Korea	Greece	Ireland	Denmark	
	Brazil	UAE		South Africa	Hungary	New Zealand	Finland	
	China			Taiwan	Italy	UK	Germany	
	Colombia			Turkey	Poland	USA	Netherlands	
	Egypt				Portugal		Norway	
	India				Romania		Sweden	
	Indonesia				Slovakia		Switzerland	
	Kazakhstan				Spain			
	Malaysia							
	Mexico							
	Morocco							
	Nigeria							
	Pakistan							
	Peru							
	Philippines							
	Russia							
	Thailand							
	Ukraine							
	Vietnam							

**Source:** The author's work (2024), based on Hall and Soskice (2001) and Witt et al. (2018).

### 3.3 INDEPENDENT VARIABLES

The independent variables in this study correspond to the countries' VoC, as Hall and Soskice (2001) outlined. In alignment with the proposed hypotheses, the explanatory variables pertain to the dimensions of capitalism: labor and industrial relations (LABOR), finance (FINANCE), relations between Higher Education Institutions (HEIs) (INTERFIRM), education (EDUCATION), and governance (GOVERNANCE). In Table 6, we consolidate the variable's source descriptions.

**Table 6 – Variables source description**

Dimension	Variable	Operationalization	Previous Studies	Source
LABOR	Overall score	The THE Ranking's overall score of HEIs' actions toward 17 SDGs ranges from 0 to 100.	Galleli, et al. (2021)	Times Higher Education
	Bargaining coverage	The percentage of labor force covered by collective bargaining ranges from 0 to 100.	Ioannou & Serafeim (2012), Jensen & Berg (2012)	International labor organization
FINANCE	Market capitalization	The market capitalization of listed domestic HEIs (% of GDP) ranges from 0 to over 100.	Hall & Soskice, (2001).	World Bank
INTER-COMPANY RELATIONS	New business density	Represents the count of newly registered limited liability corporations within a calendar year.	Hall & Thelen (2009).	World Bank
EDUCATION	Expenditure on education	Meeting the benchmark endorsed by the Education 2030 Framework for Action is indicated by values ranging from 4% to 6%.	Witt et al., (2018).	UNESCO Institute for Statistics
GOVERNANCE	Governance	The average scores of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and corruption control range from -2.5 to +2.5.	Allen & Aldred, (2011); Coluccia et al., (2018).	Worldwide Governance Indicators
	Log GDP	Log of the country's total Gross Domestic Product.	Ojeyinka et al., (2022).	World Bank
	Economic freedom index	Each country receives a score on a scale from 0 (no freedom) to 100 (highest level of freedom).	Campbell (2007); Graafland & Noorderhaven (2020).	The heritage foundation
	Human development index	Each country's score was assigned, ranging from 0.484 (lowest HDI) to 0.954 (highest HDI).	Ioannou & Serafeim (2012).	United Nations Development Program

**Source:** The author's work (2024).

### 3.4 DEPENDENT VARIABLES

The study's dependent variable is the sustainable performance of HEIs in global sustainable rankings, sourced from THE-WUR University Ranking—an internationally accepted organization for classifying educational institutions (Soh, 2013). This ranking was chosen for its contemporary and holistic evaluation of institutions with global applicability.

The Times Higher Education (THE) Impact Ranking, launched in 2019, stands out as the sole ranking assessing HEIs' performance regarding the SDGs outlined in the 2030 Agenda for SD. Participation in this ranking is voluntary for HEIs, providing a global scope, and the assessment occurs at the institutional level across all SDGs. HEIs must submit information on at least three SDGs, with an obligation to include information related to SDG 17. The ranking scores range from 0 (indicating the lowest sustainable performance) to 100 (reflecting the highest sustainable achievement) (Veidemane, 2022).

### 3.5 CONTROL VARIABLE

A single control variable, gross domestic product (GDP), was chosen for its potential impact on the sustainable performance of HEIs in global sustainable rankings and its standard measurement across countries (Ojeyinka et al., 2022). In line with Ojeyinka et al. (2022), this study utilizes the annual GDP growth rate as a measure of economic growth for the sample countries. The GDP log is employed to ensure consistency in numerical orders. Economic growth may catalyze and promote SD. World Bank reports (World Bank, 2023) provided GDP data spanning 2019 to 2023.

### 3.6 RESEARCH ECONOMETRIC MODEL

To test the hypotheses, we conducted panel data analysis with fixed effects. This approach is chosen for its suitability in mitigating multicollinearity and estimation bias while accounting for the year's impact on the variables under examination (Hair Jr et al., 2019). Given our five-year study period (2019-2023), it becomes crucial to incorporate the temporal dimension in our data analysis. We run the following model:

$$\begin{aligned}
 \text{SUSPERF}_{(i,t)} = & \beta_0 + \beta_1 \text{LABOR}_{(i,t)} + \beta_2 \text{FINANCE}_{(i,t)} + \beta_3 \\
 & \text{INTERFIRM}_{(i,t)} + \beta_4 \text{EDUCATION}_{(i,t)} + \beta_5 \text{GOVERNANCE}_{(i,t)} + \beta_6 \text{LOG} \\
 & \text{GDP}_{(i,t)} + \varepsilon_{(i,t)}
 \end{aligned}$$

The econometric model represents the explanatory factors of the sustainable performance of HEIs in THE ranking, where  $\text{SUSPERF}_{i,t}$  is the dependent variable for sustainable performance.  $\beta_0$  is the constant, and  $\beta_1$  a  $\beta_6$  are the coefficients to be estimated. LABOR = work and labor relations, FINANCE = finance, INTERFIRM = relationships between firms, EDUCATION = education and vocational training, GOVERNANCE = governance, LOG GDP = log of gross domestic product, and  $i$  = Higher Education Institution,  $t$  = year. Furthermore,  $\mu$  represents the constant and unobservable characteristics of HEIs potentially related to sustainable performance (the unobservable heterogeneity), and  $\varepsilon$  is the error term.

In addition to panel data analysis, we performed several tests to choose the more parsimonious model as a robustness analysis. The tests were performed, such as the Fixed Effects F Test – Fisher, VIF (value inflation factor), Lagrange Multipliers, Hausman (Honda), and Hausman-Taylor Estimator. All this makes it possible to give more confidence to the findings. All statistical and visual graphic analyses were performed using RStudio 4.2.3. Graphical analyses were conducted using the *tidyverse*, a set of integrated R packages outlined in Grolemund and Wickham's (2018) work, designed to streamline data science processes and make them efficient, expressive, and enjoyable.

## 4 RESULTS PRESENTATION

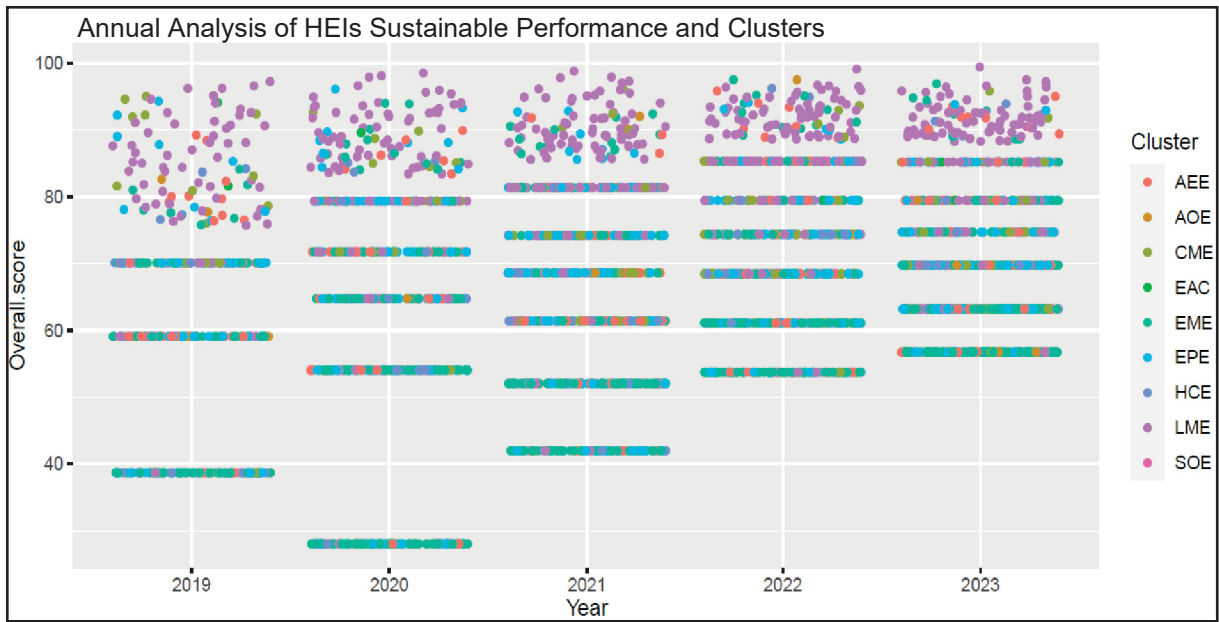
In this section, we will examine the sustainable performance of HEIs in global sustainable rankings in three stages. First, drawing on insights from Sachs (1977), Yeager (2007) and Grolemond & Wickham (2018), a graphical analysis will depict the performance of HEIs among clusters over time. Second, Freund's (2009) methodology will be employed to present descriptive statistics of independent variables, encompassing average, standard deviation, median, minimum, and maximum values. Finally, a thorough analysis utilizing panel data, as advocated by Colonescu (2016) and Henningsen and Henningsen (2019), will be conducted. This analysis will commence with VoC clusters, proceed to VoC dimensions, and culminate in an examination of the overall model for the sustainable performance of HEIs in global sustainable rankings.

### 4.1 GRAPHICAL ANALYSIS: INITIAL APPROACH TO THE PHENOMENON

Graphical analysis serves as a fundamental initial step in the quantitative data analysis process, offering a visual representation of intricate data sets to identify patterns and outliers (Koschat, 1996; Yeager, 2007). Particularly useful in exploratory studies, graphical methods such as scatter plots and probability plots aid in revealing distributional peculiarities and assessing statistical assumptions (Sachs, 1977). This preliminary exploration through graphical analysis plays a role in understanding the quantitative data and can guide further investigation.

The primary aim of the graphical approach is to visually depict the behavior of data over the years within their respective clusters. Figure 1 displays scores of leading HEIs, with layers based on scores over a five-year period. The x-axis represents time, and the y-axis represents overall scores in THE ranking. Notably, the top scores are predominantly dominated by HEIs in the Liberal Market Economies (LME) cluster, represented by light purple dots. The influence of COVID-19 in 2020 is evident in the widened gap among lower layers. Over the years, the decreasing distance among layers suggests mimetic institutional behavior among HEIs, aiming to attain sustainable performance akin to top-ranked institutions.

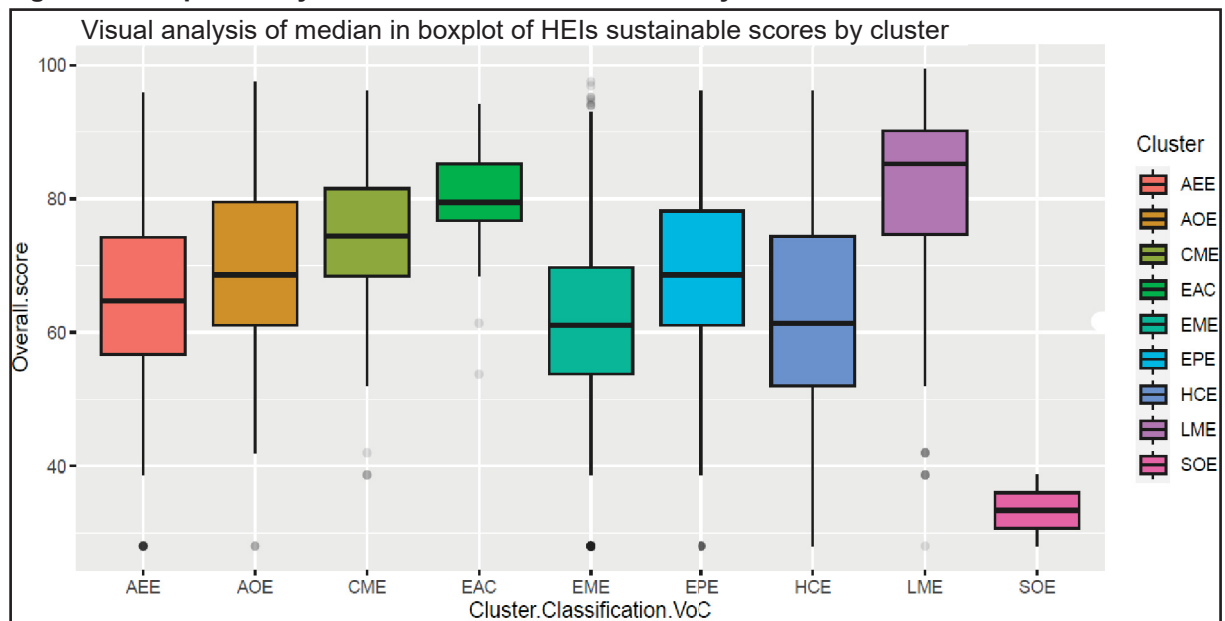
**Figure 1 - HEIs scores in sustainable rankings over time: A visual analysis**



Source: The authors' work (2024).

In sequence, Figure 2 exhibits a boxplot analysis to visualize the sustainable performance of HEIs, measured by the overall score in THE Impact Ranking, within their respective clusters. LME cluster shows the highest median among clusters. Conversely, the SOE cluster demonstrates the lowest performance, while the EOE cluster exhibits noteworthy sustainable performance, followed by CME, AOE, and EPE clusters.

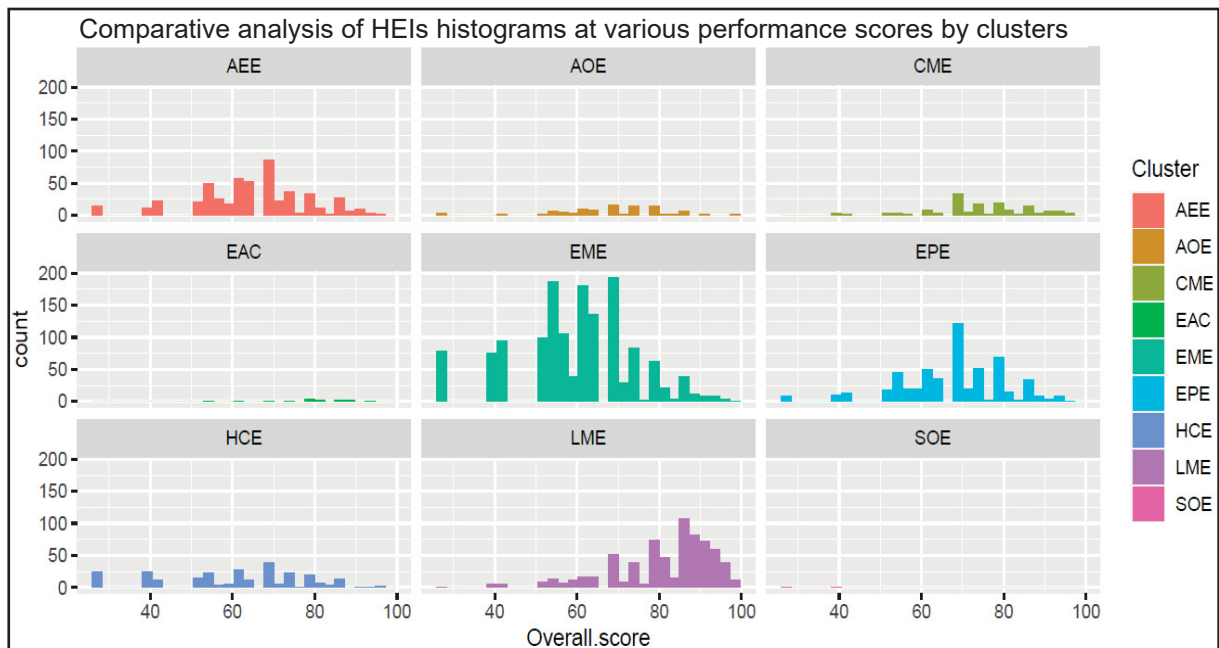
**Figure 2 - Boxplot Analysis of HEIs sustainable scores by cluster**



Source: The authors' work (2024).

Figure 3 displays histograms representing the count of HEIs at different performance scores within their respective clusters. The data is presented by cluster on the same scale, facilitating comparisons. The LME cluster exhibits the highest concentration of HEIs at the top overall scores, while the SOE cluster displays the lowest performance. The EME, EPE, and AEE clusters show many HEIs in the middle range of overall scores. In contrast, the CME, AOE, and HCE clusters demonstrate a uniform distribution of HEIs across average overall scores.

**Figure 3 - Histograms of HEIs at various performance scores by clusters**



**Source:** The authors' work (2024).

## 4.2 DESCRIPTIVE ANALYSIS OF INDEPENDENT VARIABLES

Table 7 presents vital descriptive statistics for the 59 countries analyzed. The top five countries in the overall THE ranking score include New Zealand (88.27), Australia (87.36), Canada (86.44), Denmark (86.25), and the United Kingdom (83.49). Conversely, the bottom five countries are Nigeria (54.91), Kazakhstan (51.24), Ukraine (49.73), Algeria (46.87), and Venezuela (33.38). Regarding Bargaining Coverage, the top five countries are Italy (99.00), Austria (98.00), France (98.00), Belgium (96.00), and Sweden (90.00), while the bottom five include Peru (2.60), Bangladesh (1.60), Philippines (1.40), Thailand (1.10), and Malaysia (0.40).

Concerning the market capitalization of domestic companies, the top five are South Africa (282.22), Switzerland (270.30), Saudi Arabia (244.11), Sweden (181.58), and the United States (172.61). The bottom five include Egypt (12.04), Romania (11.84), Nigeria (10.79), Slovakia (3.43), and Algeria (0.02). Related to new business density, the top five are Hong Kong (25.71), the United Kingdom (17.76), New Zealand (16.31), Australia (15.25), and Chile (12.12). The bottom five are Egypt (0.21), Argentina (0.17), India (0.14), Pakistan (0.12), and Bangladesh (0.01).

In terms of expenditure on education over GDP, the top five are Saudi Arabia (7.64), Sweden (7.42), Denmark (7.37), Norway (7.29), and Algeria (6.58). The bottom five are Egypt (3.09), Venezuela (2.67), Pakistan (2.49), Bangladesh (2.17), and Nigeria (0.53). In terms of governance, the top five are Finland (1.74), Norway (1.71), Denmark (1.70), New Zealand (1.69), and Switzerland (1.69). The bottom includes Bangladesh (-0.84), Algeria (-0.89), Pakistan (-0.93), Nigeria (-1.08), and Venezuela (-1.83).

**Table 7 - Descriptive Statistics**

Variable	Observations	25%	Mean	75%	Std. Dev.	Min.	Max.
Overall Score	3,749	56.75	66.58	79.45	5.83	28.05	99.40
Bargaining Coverage	2,957	15.00	34.28	61.20	28.78	0.40	99.00
Market Capitalization	2,640	35.30	87.14	128.76	57.49	0.01	330.81
New Business Density	2,599	0.47	4.11	4.57	5.32	0.00	29.28
Expenditure on Education	2,744	3.51	4.42	5.08	.30	0.00	8.13
Governance	2,854	-0.32	0.39	1.19	0.84	-1.85	1.77
Log GDP	2,742	11.61	12.08	12.43	0.53	11.02	13.40
Economic Freedom Index	3,749	58.3	66.13	74.00	10.24	0.00	90.20
Human Development Index	3,596	0.75	0.83	0.92	0.11	0.53	0.96

**Source:** The author's work (2024).

Table 8 presents the correlation matrix. Correlation coefficients exceeding 0.80 can lead to collinearity issues in the analysis (Hair et al., 2019). The findings demonstrate that all coefficients are below 0.53. Multicollinearity does not pose a concern in our study.

**Table 8 - Pairwise correlation matrix**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) Overall Score	1.00					
(2) Bargaining Coverage	0.19***	1.00				
(3) Market Capitalization	0.32***	-0.08***	1.00			
(4) New Business Density	0.41***	0.11***	0.36***	1.00		
(5) Expenditure on Education	0.26***	0.33***	0.33***	0.27***	1.00	
(6) Governance Total	0.44***	0.25***	0.53***	0.47***	0.29***	1.00
(7) log GDP	0.14***	-0.01	0.47***	0.07***	0.04*	0.33***

**Source:** The authors' work (2024).

### 4.3 PANEL DATA ANALYSIS

The vast field of Panel Data Econometrics with R, elucidated by Croissant and Millo (2008), encompasses a variety of models and applications. In the present study, the R package "plm" is justified, leveraging its tailored estimators for robust models and covariance matrices, along with tests specifically designed for panel data econometrics (Colonescu, 2016). These tests cover within/fixed effects, random effects, between, first difference, nested random effects models, instrumental variables (IV) models, and Hausman-Taylor style models, as detailed by Croissant and Millo (2008).

As outlined by Henningsen and Henningsen (2019), panel datasets can manifest as either balanced or imbalanced. A balanced panel dataset encompasses observations across all possible combinations of cross-sectional and temporal dimensions, constituting the total number of observations. Conversely, an imbalanced panel dataset exhibits missing observations for specific cross-sectional and temporal combinations, potentially resulting in disparities in the total number of observations and lengths of individual time series.

Following the tabulation of raw data, the panel organization involves grouping and concatenating variables while identifying the unit of analysis and the temporal variable (year variable). The balance of the panel is subsequently examined using the "pdim" function, which assesses the count of individuals and temporal observations within the panel, determining whether it is balanced or unbalanced. Essential information, including the number of analysis units (n), time series (T), and the total number of observations (N), is obtained. The robust yet unbalanced configuration of

the examined panel comprises 1,459 analysis units or HEIs, each associated with a time series spanning 1 to 5 years, resulting in a cumulative total of 3,749 observations, with a notable preeminence of analysis units over time series.

To assess panel imbalance, Ahrens and Pincus (1981) recommend using "gamma" ( $\gamma$ ) and "nu" ( $\nu$ ), converging to 1 in balanced panel data. As the data becomes more "unbalanced," these measures diminish ( $> 0$ ). Ahrens and Pincus (1981) prescribe upper and lower limits for  $\gamma$  and  $\nu$  between 0 and 1. Reporting gamma as 0.69 and nu as 0.75, the panel imbalance is 24.49%, which is considered acceptable in model testing and contributes to the robustness of the analysis. The robust nature of the panel allows for some gaps, emphasizing its tolerance in the study.

It involves examining variations between analysis units along the transverse axis ( $y$ ) and variations over time along the longitudinal axis ( $x$ ). This is fundamental for understanding units over time in time series. The subsequent step in panel data analysis involves developing econometric models subject to various tests to determine the most economical model. Three models are considered: the Pooled Model, treating data collectively without considering variations; the Fixed Effects Model ("Within"), introducing dummy variables to account for unit and time effects; and the Random Effects Model, distributing effects randomly across the sample in longitudinal and transverse axes, offering efficiency advantages over the Fixed Effects Model despite potential bias consistency issues.

In the iterative process of determining the most suitable econometric model, three distinct models are developed, followed by post hoc tests to validate and identify the most parsimonious model for analyzing the phenomenon (Jalloh, 2015; Colonescu, 2016). The Fixed Effects F Test, akin to an ANOVA test, compares the fixed effects model against the pooled model, with the principle of parsimony guiding the choice based on the null hypothesis that there is no difference between the two models. If a difference is detected, the Lagrange Multipliers test is employed to compare the random model against the fixed effects model, selecting the random model if a difference is found with a p-value  $< 0.05$ . However, recognizing the potential consistency problems of the random model, the Hausman (Honda) test is conducted, rejecting the null hypothesis if the p-value is less than 0.05 and prompting further testing to rectify the endogeneity of the model.

The subsequent Hausman-Taylor Estimator investigation focuses on affirming the selected model's consistency, particularly evaluating whether the random model

remains unbiased when addressing endogeneity. Due to the endogeneity challenge associated with the random effects model, instrumental variable methods are employed when incorporating time-invariant regressors. The Hausman-Taylor estimator utilizes instrumental variables within a random effects model, considering four categories of regressors: time-varying exogenous, time-varying endogenous, time-invariant exogenous, and time-invariant endogenous. This test employs instrumental variable estimation based on the Baltagi transformation (Baltagi, 2014; Baltagi & Khanti-Akom, 1990; Baltagi & Baltagi, 2008; Colonescu, 2016).

Following the presented methodology, our analysis will proceed from a macro to a micro approach. We will start by examining the sustainable performance of HEIs in global sustainable rankings based on the cluster classification of VoC. Subsequently, we will explore the influence of each institutional dimension within each cluster, concluding the analysis with the proposed general model based on the five VoC dimensions.

#### 4.3.1 Analysis of Varieties of Capitalism Cluster Classification

Commencing the analysis of models, our initial focus lies on the pooling and regression model, which incorporates cluster classification based on the VoC (Hall & Soskice, 2001; Whitt et al., 2018). This classification is associated with the overall scores of HEIs within countries, as indicated by their standings in the Times Higher Education (THE) ranking. The VoC clusters demonstrate significance, with the majority achieving levels as low as 0.001.

Observing the statistical significance across all clusters in the models, the predominantly positive sign of VoC cluster coefficients implies a positive contribution of cluster characteristics to HEIs' performance in the Times Higher Education (THE) ranking. The control variable shows no significance, and the Variance Inflation Factor (VIF) results indicate no significant multicollinearity concerns, well below the threshold margin, with VIF values of 1.12 for Mod Pooling and 1.11 for Mod Random. The adjusted R-squared for Mod Pooling and Random is 0.27, with a p-value of 2.22e-16. The ensuing results and subsequent in-depth analysis are presented in Table 9, involving the scrutiny of residuals and regression coefficients.

**Table 9 - Multivariate panel data regression result on VoC**

Variable and Statistical Tests	Pooling Model	Within Model	Random Model
Arab Oil-Based Economies - AOE	4.728*		6.314*
Coordinated Market Economies - CME	11.871***		12.159***
Economies Of Advanced Cities - EAC	15.147***		17.270**
Emerging Economies - EME	-4.102***		-3.593**
European Peripheral Economies - EPE	4.588***		4.314**
Advanced Emergent Economies - AEE	2.925***		3.522**
Highly Coordinated Economies - HCE	-3.910**		-6.341**
Liberal Market Economies – LME	18.913***		18.325***
Socialist Economies – SOE	-31.466**		-31.325***
Log GDP	-0.40541	39.838***	0.945
VIF Mean	1,12		1,11
Adj. R-Squared	0.269		0.269
F-statistic	127.525***		
Fixed Effects F Test		4.092***	
Lagrange Multiplier Test			26.016***
Hausman Test			11.394
Year effects	Yes	Yes	Yes
Analysis units	2,742	2,742	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

In the within model, Log GDP is identified as statistically significant (p-value: 3.497e-13), contrasting the pooling model. An F-test between Mod Within and Mod Pooling rejects the null hypothesis, favoring the within model. The random model mirrors the pooling model, with all variables exhibiting statistical significance, excluding the control variable. The random model's negative intercept of EME and HCE aligns with the pooling findings. The adjusted R-squared of Mod Random is 0.27, with a p-value of 2.22e-16. The Lagrange Multipliers test results in a p-value of 2.2e-16, rejecting the null hypothesis and favoring the random model. The Hausman test, with a chi-square of 11.40 and a p-value of 0.18, chooses the random model to assess endogeneity by comparing it with the consistent pooling model.

#### 4.3.2 Varieties of Capitalism Institutional Dimensions Analysis

To investigate the impact of institutional dimensions on the sustainable performance of HEIs in global sustainable rankings, we conducted a multivariate

regression analysis using panel data for each of the five VoC dimensions. The methodology applied for model analysis and robustness tests aligns with the current investigation.

#### 4.3.2.1 Labor

In examining the labor dimension of the VoC, we investigate the association between national-level cooperation between employees and employers and the sustainable performance of HEIs. The analysis, employing the Pooled, Fixed Effects Model ("Within") and Random Effects Model, reveals notable findings. In the Pooled model, the positive sign of the bargaining coverage coefficients suggests a positive contribution to the performance of HEIs in THE ranking, and this variable is highly significant at the 0.01 level. The control variable, Log GDP, also exhibits a positive and highly significant contribution at the 0.01 level. VIF results indicate no considerable multicollinearity concerns. In the Mod Within, only the control variable - Log GDP, is statistically significant, contrasting with Mod Pooling. The results of the in-depth analysis are consolidated and displayed in Table 10.

**Table 10 - Multivariate panel data regression result on labor**

Variable	Pooling Model	Within Model	Random Model
BARGAINING COVERAGE	0.122479***		0.122527***
LOG GDP	3.512139	22.0528***	3.949693***
VIF Mean	1.00		1.00
Adj. R-Squared	0.055497		0.18935
F-statistic	67.6611***	13.8657***	
Fixed Effects F Test		6.2642***	
Lagrange Multiplier Test			30.699***
Hausman Test			0.54575
Year effects	Yes	Yes	Yes
Analysis units	2,270	2,270	2,270

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

An F test between Mod Within and Mod Pooling produces F: 6.2642, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. Subsequently, the construction of the Mod Random produces results in which all variables are statistically significant at 0.01. Mod Random's adjusted R-squared is 0.27, with a p-value of 2.22e-16. Using the Lagrange Multipliers test to compare

random and fixed effects models results in a p-value of 2.2e-16. The null hypothesis is rejected, and the Mod Random is selected. We perform the Hausman, comparing Mod Random - consistency to be checked, with Mod Pooling - consistent model, to test the endogeneity problem. The test produces a chi-square of 0.54575 with a p-value of 0.7612, accepting the null hypothesis - the models are consistent. The random model is chosen with the consistent clustering model.

#### 4.3.2.2 Finance

The financial dimension is intricately linked to a country's economic freedom, with the government's role in a free economic society centered on protecting private property and enforcing contracts (De Haan & Sturm, 2000). The results of the in-depth analysis are consolidated and displayed in Table 11.

**Table 11 - Multivariate panel data regression result on finance**

Variable	Pooling Model	Within Model	Random Model
MARKET CAPITALIZATION	0.0990132***	-0.023195	0.028930**
LOG GDP	-1.036141	11.143786	-0.704053
VIF Mean	1,48		1,36
Adj. R-Squared	0.28738		0.27979
F-statistic	141.001***	4.51723***	
Fixed Effects F Test		4.4844***	
Lagrange Multiplier Test			24.029***
Hausman Test			6.5456
Year effects	Yes	Yes	Yes
Analysis units	2,084	2,084	2,084

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

The analysis, employing the Pooled, Fixed Effects Model ("Within") and Random Effects Model, yields significant insights. In the Pooled model, the positive coefficient (0.0990132) for the market capitalization of domestic companies suggests a favorable contribution to the performance of HEIs in THE ranking, and this variable is highly significant at the 0.01 level. However, the control variable, Log GDP, shows a negative (-1.3175610) and non-significant contribution. VIF results indicate no significant multicollinearity concerns. In the Mod Within, only the control variable - Log GDP, is statistically significant, contrasting with Mod Pooling. An F test between Mod Within and Mod Pooling supports the within model. The Mod Random, with a

statistically significant market capitalization variable at 0.01, achieves an adjusted R-squared of 0.19, with a p-value of 2.22e-16. The Hausman test rejects the null hypothesis, favoring the consistent Mod Random. However, applying the Hausman-Taylor Estimator in Table 12, employing instrumental variable estimation based on the Baltagi transformation, results in adjustments to the coefficients of variables, enhancing the robustness of the analysis (Colonescu, 2016).

**Table 12 - Endogeneity correction with Hausman-Taylor**

<b>Variable</b>	<b>Random Model</b>
MARKET CAPITALIZATION	0.0611611***
LOG GDP	2.0537824*
Idiosyncratic	82.858
Individual	237.981
Analysis units	2,640

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01  
**Source:** The authors' work (2024).

#### 4.3.2.3 Intercompany relations

The New Business Density, an indicator from the World Bank, globally measures total business density by calculating the total number of registered businesses per 1,000 working-age people (15 to 64 years old). Lowrey (2004) provides literature rationales and statistical testing results demonstrating the significant linkage between business density and economic well-being at the state level. Therefore, more competitive environments may positively influence the sustainable performance of HEIs in global sustainable rankings.

In the analysis, in the Pooled model, the positive sign of the new business density coefficients suggests a positive contribution to the performance of HEIs in THE ranking, and this variable is highly significant at the 0.01 level (1.296447\*\*\*). The control variable, Log GDP, also exhibits a positive and highly significant contribution at the 0.01 level (3.715742\*\*\*). VIF results indicate no significant multicollinearity concerns. In the Mod Within, the new business density and control variable - Log GDP, is statistically significant. The results of the in-depth analysis are consolidated and displayed in Table 13.

**Table 13 - Multivariate panel data regression result on intercompany**

Variable	Pooling Model	Within Model	Random Model
NEW BUSINESS DENSITY	1.296447***	0.88645*	1.320960***
LOG GDP	3.715742***	36.99190***	4.314464***
VIF Mean	1.00		1.00
Adj. R-Squared	0.17985	-0.80384	0.22968
F-statistic	285.865***	26.63***	
Fixed Effects F Test		4.6864***	
Lagrange Multiplier Test			29.416***
Hausman Test			1.274
Year effects	Yes	Yes	Yes
Analysis units	2,599	2,599	2,599

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

An F test between Mod Within and Mod Pooling produces F: 4.6864\*\*\*, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. Subsequently, the construction of the Mod Random produces results in which all variables are statistically significant at 0.01 (new business density: 1.320960\*\*\* and 4.314464\*\*\*). Mod Random's adjusted R-squared is 0.23, with a p-value of 2.22e-16. Using the Lagrange Multipliers test to compare random and fixed effects models results in a p-value of 2.2e-16. The null hypothesis is rejected, and the Mod Random is selected. We perform the Hausman, comparing Mod Random - consistency to be checked, with Mod Pooling - consistent model, to test the endogeneity problem. The test produces a chi-square of 1.274 with a p-value of 0.5289, accepting the null hypothesis - the models are consistent. The random model is chosen with the consistent clustering model.

#### 4.3.2.4 Education

Education over GDP, a metric for national development progress, represents general government expenditure on education (current, capital, and transfers) as a percentage of GDP (Schneider, 2007; Lutz, 2008; Nistor, 2018). This calculation includes costs funded by international transfers to the government and relies on World Bank estimates. The UNESCO Institute for Statistics ensures comparability by collecting education data from official responses to its annual education survey and mapping all data to the International Standard Classification of 5.415\*\*\* Education, a

key component of human development, is expected to positively impact the sustainable performance of HEIs in global sustainable rankings.

In the Pooled model, the positive sign of the expenditure on education over GDP coefficients suggests a positive contribution to the performance of HEIs in THE ranking, and this variable is highly significant at the 0.01 level (3.31259\*\*\*). The control variable, Log GDP, also exhibits a positive and highly significant contribution at the 0.01 level (4.10553\*\*\*). VIF results indicate no significant multicollinearity concerns. In the Mod Within, the expenditure on education over GDP suggests a negative relation to the performance of HEIs in THE ranking (-0.35182). The results of the in-depth analysis are consolidated and displayed in Table 14.

**Table 14 - Multivariate panel data regression result on education**

Variable	Pooling Model	Within Model	Random Model
EXPENDITURE ON EDUCATION	3.31259***	-0.35182	1.57276***
LOG GDP	4.10553***	41.68724***	4.89490***
VIF Mean	1.00		1.00
Adj. R-Squared	0.083923	-0.80289	0.18463
F-statistic	126.553***	27.6699***	
Fixed Effects F Test		5.415***	
Lagrange Multiplier Test			30.188***
Hausman Test			519.13***
Year effects	Yes	Yes	Yes
Analysis units	2,742	2,742	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

However, the control variable - Log GDP, is statistically significant (41.68724\*\*\*). An F test between Mod Within and Mod Pooling produces F: 5.415\*\*\*, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. Subsequently, the construction of the Mod Random produces results in which all variables are statistically significant at 0.01 (expenditure on education over GDP: 1.57276\*\*\* and Log GDP: 4.89490\*\*\*). Mod Random's adjusted R-squared is 0.18, with a p-value of 2.22e-16. Using the Lagrange Multipliers test to compare random and fixed effects models results in a p-value of 2.2e-16. The null hypothesis is rejected, and the Mod Random is selected. We perform the Hausman, comparing Mod Random - consistency to be checked, with Mod Pooling - consistent model, to test the endogeneity problem. The test produces a chi-square of 519.13\*\*\* with a p-value of

2.22e-16, rejecting the null hypothesis - the models are consistent. However, applying the Hausman-Taylor Estimator in Table 15, employing instrumental variable estimation based on the Baltagi transformation, results in adjustments to the coefficients of variables, enhancing the robustness of the analysis (Colonescu, 2016).

**Table 15 - Endogeneity Correction with Hausman-Taylor**

Variable	Random Model
EXPENDITURE ON EDUCATION	0.86276***
LOG GDP	5.99097***
Idiosyncratic	85.045
Individual	315.527
Analysis units	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

#### 4.3.2.5 Governance

Governance is characterized by formal regulations, corruption control, and law enforcement (Allen & Aldred, 2011). The WGI are valuable tools for researchers and analysts, facilitating the assessment of governance perceptions across nations and temporal shifts (Kaufmann et al., 2011). Despite minor fluctuations, the WGI exhibits relative stability over time (Gallego-Álvarez, 2021). We derive a composite indicator from the average scores of the six WGI indicators. The results of the in-depth analysis are consolidated and displayed in Table 16.

**Table 16 - Multivariate panel data regression result on governance**

Variable	Pooling Model	Within Model	Random Model
GOVERNANCE	9.11333***	9.7225*	8.40552***
LOG GDP	-0.27229	44.7718***	1.07064
VIF Mean	1.12		1.10
Adj. R-Squared	0.2034	-0.79766	0.23147
F-statistic	350.935***	29.8786***	
Fixed Effects F Test		4.5754***	
Lagrange Multiplier Test			27.515***
Hausman Test			8.6463*
Year effects	Yes	Yes	Yes
Analysis units	2,742	2,742	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

In the Pooled model, the positive sign of the governance coefficient suggests a positive contribution to the performance of HEIs in THE ranking, and this variable is highly significant at the 0.01 level (9.11333\*\*\*). The control variable, Log GDP, exhibits a negative and non-significant contribution (-0.27229). VIF results indicate no significant multicollinearity concerns. In Mod Within, the governance suggests a positive relation to the performance of HEIs in THE ranking (9.7225\*). The control variable - Log GDP, is statistically significant (44.7718\*\*\*). An F test between Mod Within and Mod Pooling produces F: 4.5754\*\*\*, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. Subsequently, the construction of the Mod Random produces results in which governance is statistically significant at 0.01(8.40552\*\*\*). However, the Log GDP is not substantial (1.07064). Mod Random's adjusted R-squared is 0.23, with a p-value of 2.22e-16. Using the Lagrange Multipliers test to compare random and fixed effects models results in a p-value of 2.2e-16. The null hypothesis is rejected, and the Mod Random is selected. We perform the Hausman, comparing Mod Random - consistency to be checked, with Mod Pooling - consistent model, to test the endogeneity problem. The test produces a chi-square of 8.6463 with a p-value of 0.01326, rejecting the null hypothesis - the models are consistent.

**Table 17 - Endogeneity Correction with Hausman-Taylor**

<b>Variable</b>	<b>Random Model</b>
GOVERNANCE	7.93141***
LOG GDP	3.12945**
Idiosyncratic	84.798
Individual	387.423
Analysis units	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

However, applying the Hausman-Taylor Estimator in Table 17, employing instrumental variable estimation based on the Baltagi transformation, results in adjustments to the coefficients of variables, enhancing the robustness of the analysis (Colonescu, 2016).

#### 4.3.2.6 Additional Analysis of Economic Freedom and Human Development

To grasp the finance and education dimensions within the VoC framework comprehensively, we extensively analyze economic freedom and human development, aiming to uncover their potential correlation with the sustainable performance of HEIs in global rankings. Economic freedom encompasses business creation, access to financial capital, and minimal government intervention. Human development is associated with education, health, water, and sewage infrastructure, constituting a composite measure of health, knowledge, and living standards achievements.

The Economic Freedom Index (EFI) and Human Development Index (HDI) are crucial for understanding and fostering societal development (Gwartney, 2003; Campbell (2007). The EFI serves as a valuable metric, assessing a country's degree of economic freedom, reflecting property rights, rule of law, and free-market principles (Campbell, 2007). Countries with higher EFI scores often experience increased economic growth, innovation, and overall prosperity (Graafland & Noorderhaven, 2020). Simultaneously, the HDI provides a comprehensive measure of human well-being, considering factors such as life expectancy, education, and income (Georgiou, 2015).

Integrating both indices offers a holistic perspective on a society's development, as economic freedom and human development are interconnected (Ioannou & Serafeim, 2012; Georgiou, 2015). Nations with high economic freedom often witness improved living standards, education, and healthcare, enhancing human development (Georgiou, 2015). Consequently, analyzing the EFI and HDI in tandem provides policymakers and researchers with valuable insights to formulate strategies that promote balanced and sustainable development across economic and societal dimensions (Gwartney, 2003; Georgiou, 2015; Graafland & Noorderhaven, 2020).

This investigation is motivated by previous studies by Campbell (2007), Graafland & Noorderhaven (2020) on economic freedom, and Ioannou & Serafeim (2012) on human development. Drawing insights from these studies, our objective is to formulate a framework that accurately represents the reality of HEIs in terms of their sustainable performance on a global scale. Furthermore, we developed a graphical visualization of the data behavior of these variables to support the elaboration of the framework.

#### 4.3.2.7 Economic Freedom

Regarding the Pooled model, the positive sign of the economic freedom coefficients suggests a favorable impact on the performance of Higher Education Institutions (HEIs) in THE ranking, with high statistical significance at the 0.01 level. The control variable, Log GDP, also demonstrates a positive and significant contribution at the 0.01 level, and VIF results indicate no significant multicollinearity concerns. The results of the in-depth analysis are consolidated and displayed in Table 18.

**Table 18 - Multivariate panel data regression result on economic freedom**

Variable	Pooling Model	Within Model	Random Model
ECONOMIC FREEDOM	0.60927***	-0.282067***	0.275524***
LOG GDP	2.22932***	33.951707***	4.384164***
VIF Mean	1.04		1.02
Adj. R-Squared	0.13684	-0.78179	0.17791
F-statistic	218.266***	36.6707***	
Fixed Effects F Test		5.1091***	
Lagrange Multiplier Test			26.287***
Hausman Test			300.83***
Year effects	Yes	Yes	Yes
Analysis units	2,742	2,742	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

Both variables are statistically significant in the Mod Within, although economic freedom exhibits a negative sign. An F test between Mod Within and Mod Pooling yields F: 5.1091\*\*\*, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. Subsequently, the construction of Mod Random produces results in which all variables are positive and statistically significant at the 0.01 level, with an adjusted R-squared of 0.18 and a p-value of 2.22e-16.

**Table 19 - Endogeneity Correction with Hausman-Taylor**

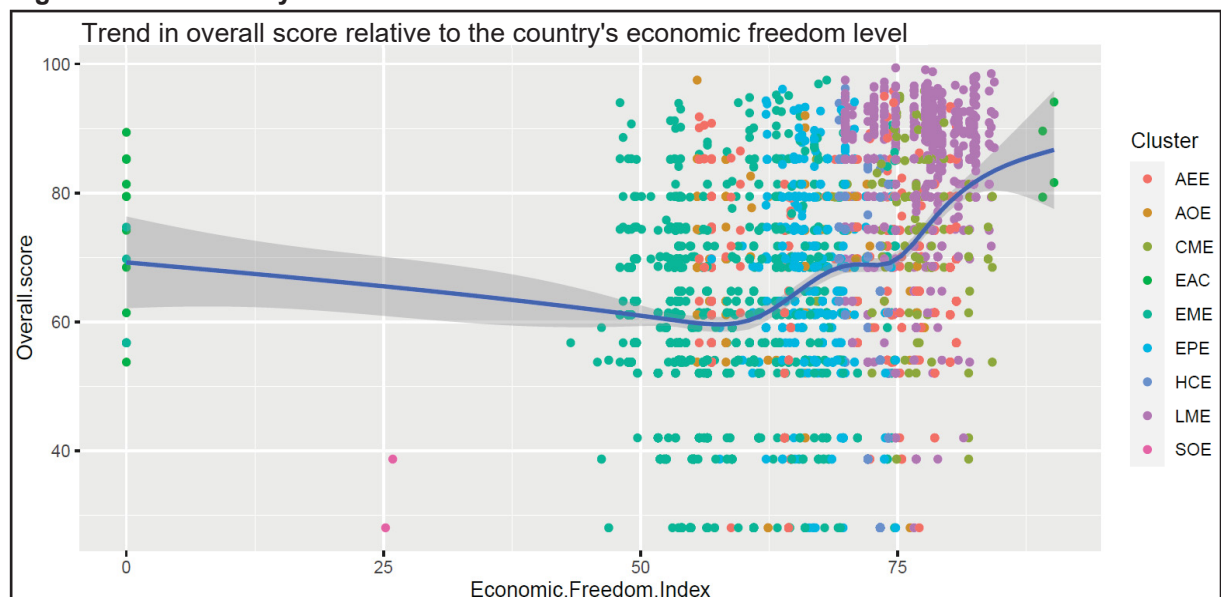
Variable	Random Model
ECONOMIC FREEDOM	0.200129***
LOG GDP	4.859873**
Idiosyncratic	84.049
Individual	258.597
Analysis units	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.0

**Source:** The authors' work (2024).

The Lagrange Multipliers test to compare random and fixed effects models yields a p-value of  $2.2e-16$ , leading to rejection of the null hypothesis, and Mod Random is selected. Performing the Hausman test, comparing Mod Random (consistency to be checked) with Mod Pooling (consistent model) produces a chi-square of 300.83 with a p-value of  $2.22e-16$ , rejecting the null hypothesis and confirming the consistency of the models. Applying the Hausman-Taylor Estimator in Table 19, employing instrumental variable estimation based on the Baltagi transformation, results in adjustments to the coefficients of variables, enhancing the robustness of the analysis (Colonescu, 2016).

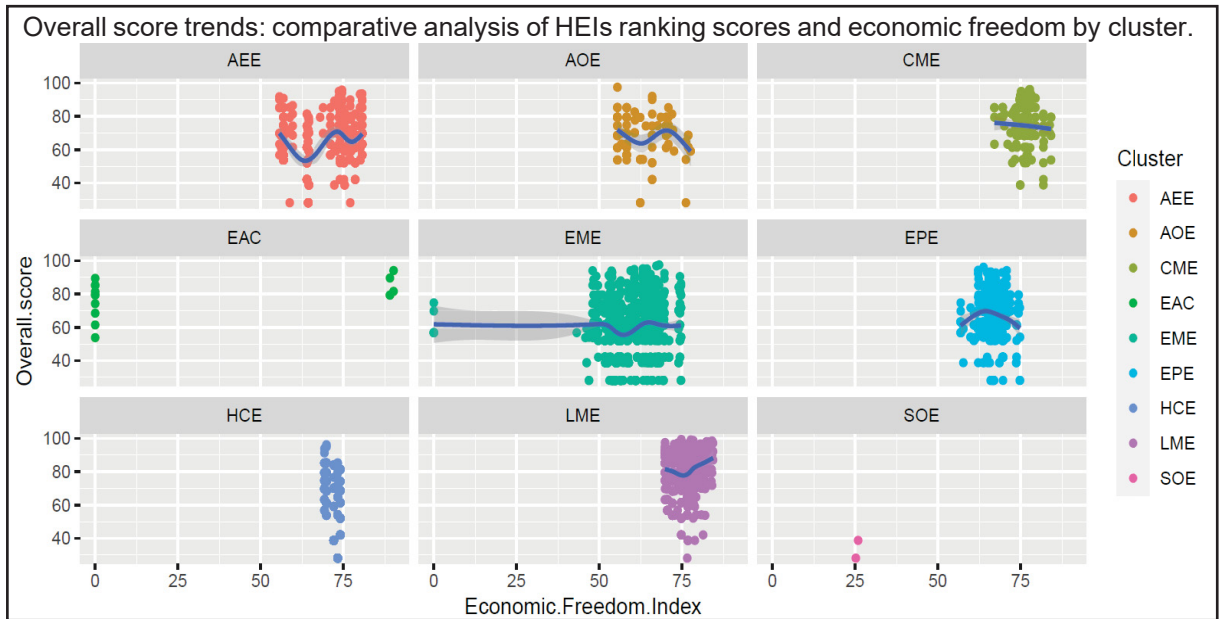
Performing a graphical analysis, as guided by the methodologies proposed by Koschat (1996) and Yeager (2007), offers a crucial and complementary visual representation of intricate datasets. This analysis unveils discernible patterns among VoC clusters and the sustainable performance of HEIs in global sustainable rankings.

**Figure 4 - Visual analysis of clusters' economic freedom**

**Source:** The authors' work (2024).

In Figure 4, the top right ranking notices a predominant concentration of liberal market economies (LME). Examining East Asian countries, represented by Hong Kong, reveals a substantial score in economic freedom; however, their sustainable performance in HEIs does not align with this economic strength.

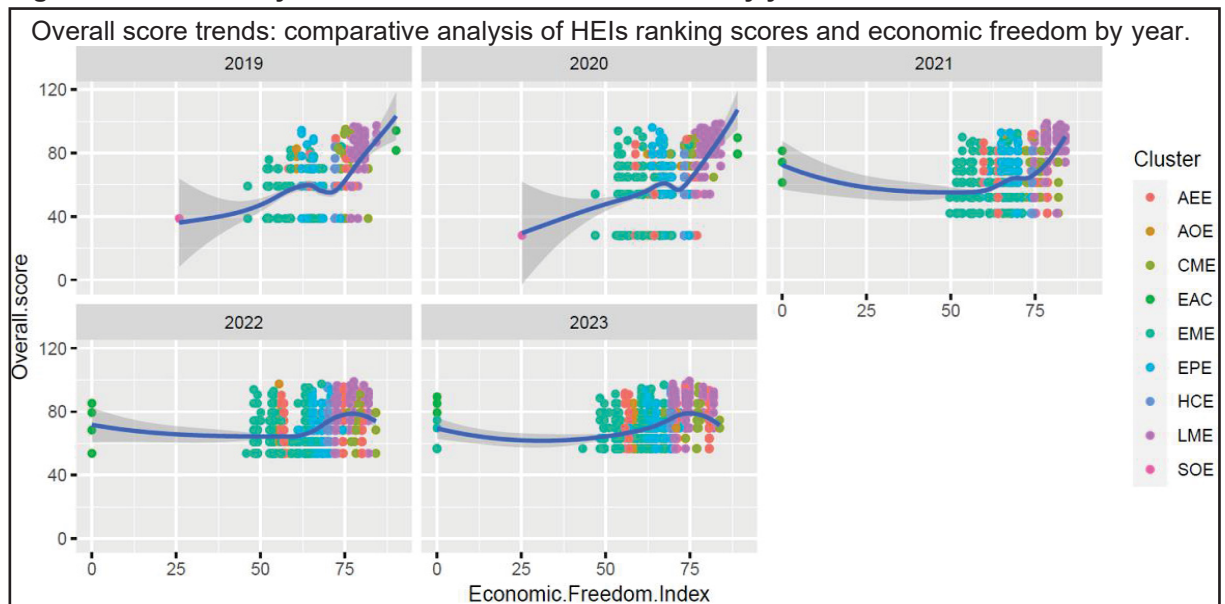
**Figure 5 - Comparative analysis of economic freedom by cluster**



Source: The authors' work (2024).

Examining VoC clusters individually in Figure 5 reveals the relationship between economic freedom and the sustainable performance of HEIs within each cluster.

**Figure 6 - Visual analysis of cluster's economic freedom by year**



Source: The authors' work (2024).

Notably, the sole cluster exhibiting an upward trend is the Liberal Market Economies (LME) cluster. Across all eight clusters, the prevailing pattern indicates a tendency to remain stable or decrease in a top-bottom direction. Analyzing the tendency between economic freedom and the sustainable performance of HEIs over the years, the influence of COVID-19 is evident across all clusters. Notably, in Figure 6, the Liberal Market Economies (LME) cluster has performed consistently. Despite the challenges posed by COVID-19, all other clusters exhibit a recovery in performance over time, while the LME cluster remains steadfast in its performance.

#### 4.3.2.8 Human Development

In the analysis of the Pooled model, the positive sign of the human development coefficients indicates a favorable impact on Higher Education Institutions (HEIs) in THE ranking, with high statistical significance at the 0.01 level (58.83275\*\*\*). Although the control variable, Log GDP, also shows a positive contribution, it lacks statistical significance. The VIF results do not indicate multicollinearity concerns. Shifting to the Mod Within, the control variable is statistically significant with a positive sign. An F test comparing Mod Within and Mod Pooling yields F: 5.0134\*\*\*, with a p-value of 2.2e-16, rejecting the null hypothesis and favoring the within model. The results of the in-depth analysis are consolidated and displayed in Table 20.

**Table 20 - Multivariate panel data regression result on human development**

Variable	Pooling Model	Within Model	Random Model
HUMAN DEVELOPMENT	58.83275***		51.14901***
LOG GDP	0.59168	39.8389***	2.10141***
VIF Mean	1.12		1.10
Adj. R-Squared	0.14015	-0.80342	0.20536
F-statistic	224.392***	53.8919***	
Fixed Effects F Test		5.0134***	
Lagrange Multiplier Test			29.294***
Hausman Test			12.564***
Year effects	Yes	Yes	Yes
Analysis units	2,742	2,742	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

Subsequently, Mod Random demonstrates positive and statistically significant results for all variables at the 0.01 level – human development performing at

51.14901\*\*\* and Log GDP at 2.10141\*\*\*, with an adjusted R-squared of 0.20 and a p-value of 2.22e-16. The Lagrange Multipliers test for comparing random and fixed effects models yields a p-value of 2.2e-16, leading to rejecting the null hypothesis, and Mod Random is selected.

**Table 21 - Endogeneity Correction with Hausman-Taylor**

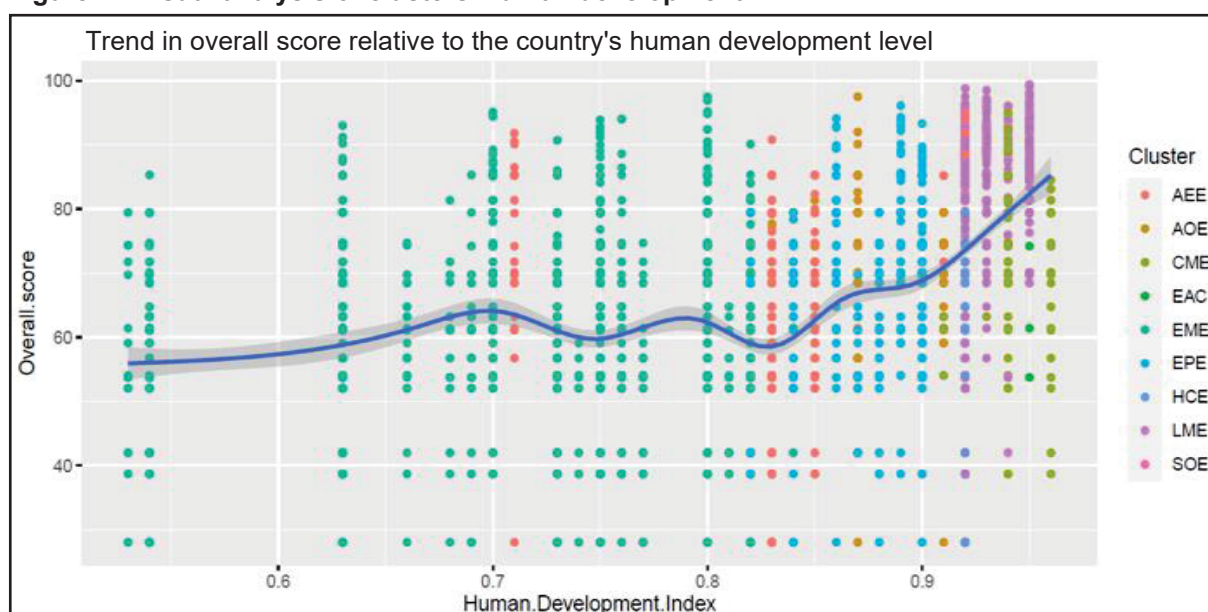
Variable	Random Model
HUMAN DEVELOPMENT	50.5861***
LOG GDP	4.0759**
Idiosyncratic	85.128
Individual	729.947
Analysis units	2,742

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024)

The Hausman test, comparing Mod Random (consistency to be checked) with Mod Pooling (consistent model), produces a chi-square of 12.564 with a p-value of 0.00187, rejecting the null hypothesis and confirming the models' consistency. Applying the Hausman-Taylor Estimator in Table 21, employing instrumental variable estimation based on the Baltagi transformation results in adjusted coefficients, enhancing the analysis's robustness (Colonescu, 2016).

**Figure 7 - Visual analysis of clusters' human development**

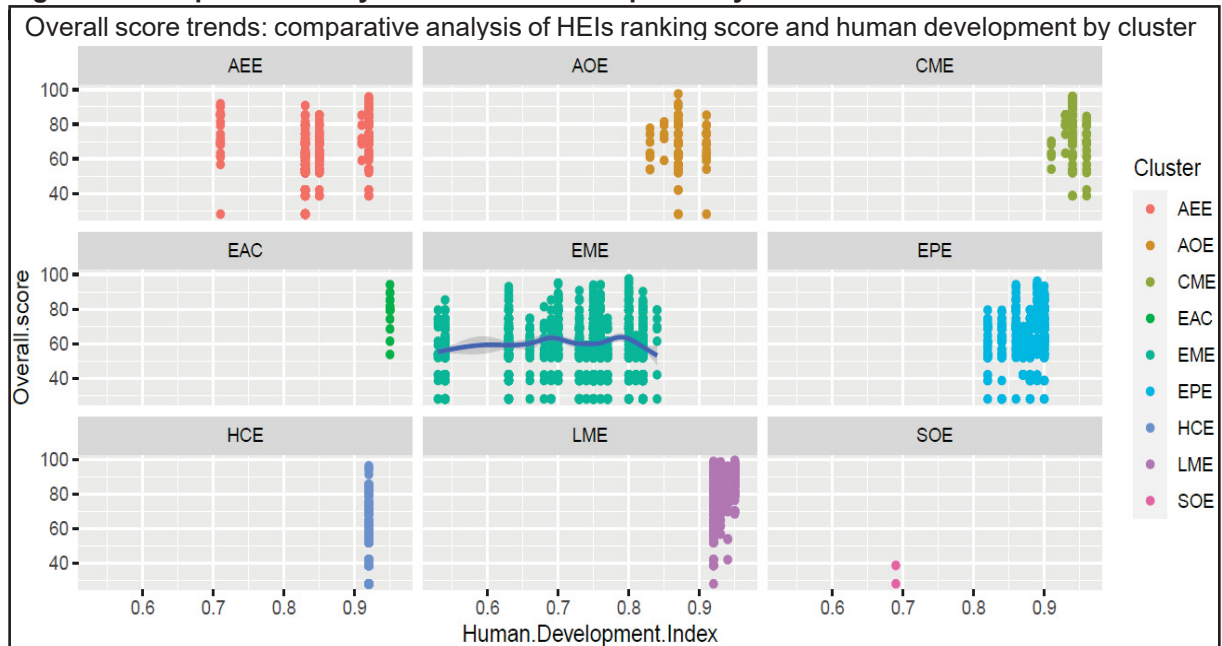


**Source:** The authors' work (2024).

Upon establishing the statistical significance of human development concerning the sustainable performance of HEIs in global rankings, we proceed with a graphical

analysis. This analysis, guided by the methodologies proposed by Koschat (1996) and Yeager (2007), involves creating visual representations of complex datasets. The objective of this analysis is to uncover patterns among VoC clusters and the sustainable performance of HEIs in global sustainable rankings. In Figure 7, the top right ranking prominently features a concentration of liberal market economies (LMEs). Countries with Coordinated Market Economies (CMEs), including Germany, Denmark, Finland, and Sweden, are characterized by high levels of coordination in their economic systems, manifested through robust social partnerships that contribute to economic stability and elevated human development levels (Jensen & Berg, 2012; Lima et al., 2021).

**Figure 8 - Comparative analysis of human development by cluster**



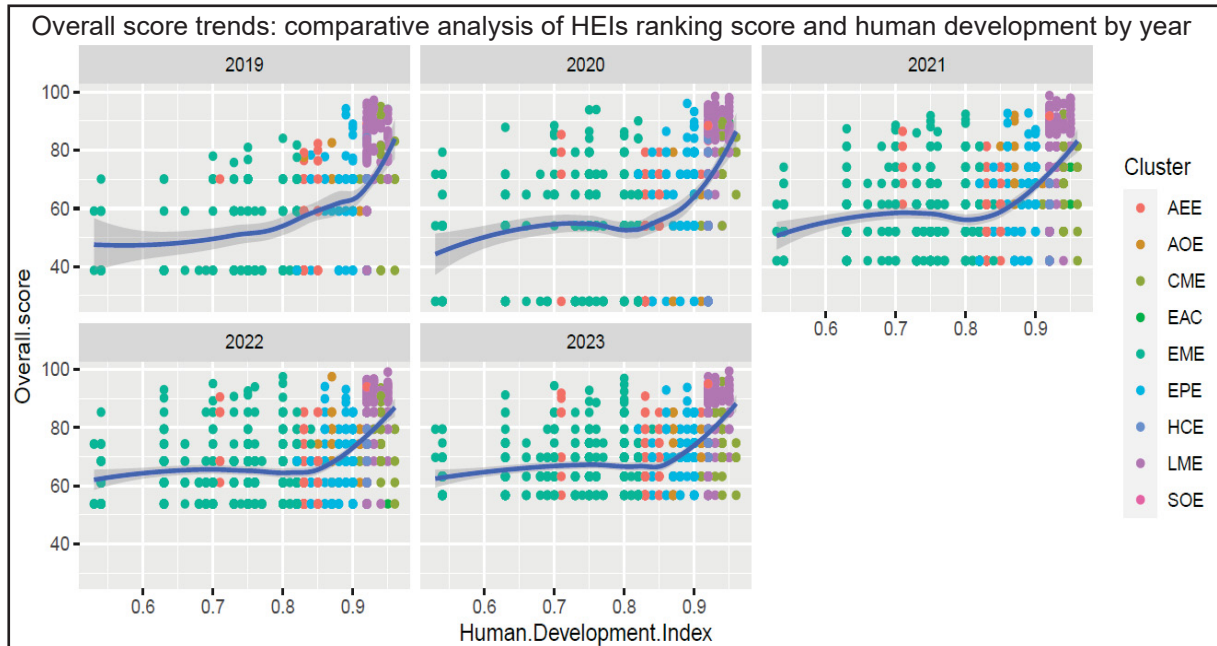
**Source:** The authors' work (2024).

Despite these positive attributes, CME countries often exhibit suboptimal performance in global sustainable rankings compared to Liberal Market Economies (LMEs) such as the United States, the United Kingdom, and New Zealand. A potential factor contributing to this performance discrepancy may be linked to economic freedom. LMEs prioritize individualism, flexibility, and free-market principles, resulting in higher economic freedom scores (De Haan & Sturm, 2000).

While this emphasis on economic freedom can lead to commendable performances in specific global rankings, examining VoC clusters individually in Figure 8 corroborates this analysis. It reveals a distinct relationship between human

development and the sustainable performance of HEIs within each cluster, notably highlighting an upward trend of top-right concentration in the Liberal Market Economies (LME) cluster.

**Figure 9 - Visual analysis of cluster's human development by year**



**Source:** The authors' work (2024).

Analyzing the relationship between human development and the sustainable performance of HEIs over the years, Figure 9 shows that the influence of COVID-19 is evident across all clusters. Notably, the Liberal Market Economies (LME) cluster has maintained consistent performance throughout the years. Despite the challenges posed by COVID-19, all other clusters exhibit a recovery in performance over time, while the LME cluster remains steadfast in its performance.

#### 4.3.3 General Model

Several studies highlight the significance of developing a general model in panel data analysis, emphasizing its role in simplifying complex real-world phenomena into easily generalizable inferences (Colonescu, 2016; Hsiao et al., 1999; Platoni et al., 2012; Duxbury, 2021). Supporting this perspective, Bollen & Brand (2010) present a general panel model encompassing standard fixed- and random-effects models as exceptional cases, offering a flexible and easily implementable approach. In alignment with these scholars, we have developed a general model based on the study's

variables concerning the sustainable performance of HEIs in global sustainable rankings.

In Table 22, we examine the General Model, encompassing the five dimensions of VoC. A Plm regression is conducted with the dependent, independent, and control variables. The regression reveals statistical significance at 0.00 in the independent variable and the intercept in the pooling model, at a p-value of 2.22e-16 and an Adj. R-squared of 0.29. The within model is significant for New Business Density at 0.00, and the other variables do not present any significance in this model. The F-test between within and pooling models rejects the null hypothesis – the pooling model. The random model indicates statistical significance for all the independent variables and the intercept at 0.01. The model's Adj. R-squared is 0.28. The Lagrange Multiplier Test (Honda) with a p-value of 2.2e-16 rejects the null hypothesis – the within model. With a chi-square of 6.55 and a p-value of 0.3649, the Hausman Test accepts the null hypothesis. The random model was chosen, and all the hypothesis research findings were supported.

**Table 22 - Multivariate panel data regression result on VoC dimensions**

Variable	Pooling Model	Within Model	Random Model
BARGAINING COVERAGE	0.0622972***		0.078478***
MARKET CAPITALIZATION	0.0332888***	-0.023195	0.028930**
NEW BUSINESS DENSITY	0.7504095***	1.765373***	0.936241***
EXPENDITURE ON EDUCATION	1.3825866***	0.095754	0.669081**
GOVERNANCE	4.9393176***	-3.413311	4.116628***
Log GDP	-1.036141	11.143786	-0.704053
VIF Mean	1,48		1,36
Adj. R-Squared	0.28738		0.27979
F-statistic	141.001***	4.51723***	
Fixed Effects F Test		4.4844***	
Lagrange Multiplier Test			24.029***
Hausman Test			6.5456
Year effects	Yes	Yes	Yes
Analysis units	2,084	2,084	2,084

**Note(s):** \*p-value < 0.1. \*\*p-value < 0.05. \*\*\*p-value < 0.01

**Source:** The authors' work (2024).

We also delved deeper into understanding which SDGs are the top 5 in average score for each VoC Cluster. Notably, SDG 17 is present in all nine clusters,

emphasizing its significance for partnerships in implementing sustainable actions—an obligatory requirement for HEIs participating in THE sustainable ranking. SDG 3, focused on health and well-being, appears in eight out of nine clusters; despite the SOE cluster not performing on that SDG, the overall HEIs reflect efforts to address the impact of the global COVID-19 pandemic. In Table 23, we consolidate the top 5 SDGs by VoC.

Six clusters (EAC, AOE, EPE, HCE, AEE, and EME) are associated with SDG 8, focusing on decent work and economic growth. Hong Kong (China) leads the EAC cluster with outstanding economic growth at a score of 72.41. SDG 4 – Quality Education, considered the twin brother of SDG 8, excels in EAC (83.58), AOE (55.30), CME (51.30), EPE (51.12), and LME (50.20). Hong Kong (China) leads in SDG 4 with a score of 83.58, followed by CME countries like Denmark (80.45), Germany (68.30), AOE country United Arab Emirates (65.76), and LME countries Australia (62.45) and the United Kingdom (50.75). Other clusters score below 50.

**Table 23 - Top 5 SDGs by VoC**

SDG	FREQ.	SDG	LME	SDG	EAC	SDG	AOE	SDG	CME
17	9	17	75.04	4	83.58	17	66.68	17	66.11
3	8	3	67.10	8	72.41	4	55.30	13	55.22
8	6	11	62.03	17	71.48	3	52.48	3	54.59
4	5	10	57.25	10	58.37	8	51.34	4	51.30
11	3	16	56.82	3	57.27	5	45.91	12	49.63
SDG	EPE	SDG	HCE	SDG	AEE	SDG	EME	SDG	SOE
17	58.95	17	55.90	17	54.10	17	51.37	16	49.38
4	51.12	3	50.54	3	53.08	4	45.58	12	40.93
8	49.36	9	45.11	4	49.25	3	44.23	17	18.20
3	49.29	11	45.01	8	47.20	8	41.04	13	13.70
5	48.00	8	42.76	9	47.00	5	38.30	11	12.20

**Source:** The authors' work (2024).

The last of the top five, SDG 11, concerning cities and sustainable communities, appears in three clusters. LME and HCE perform exceptionally well in this goal, scoring 62.03 and 45.01, respectively, while the SOE cluster scores 12.20. The LME countries, led by New Zealand, Ireland, Canada, and Australia, exhibit respective scores of 79.08, 69.27, 68.35, and 66.78. Japan in HCE performs at 45.01.

## 5 DISCUSSION

This section comprehensively analyzes the study's hypotheses and specific objectives. The initial findings indicate a temporary impact of the COVID-19 pandemic on the sustainable performance of HEIs in rankings. However, subsequent recovery and surpassing previous scores were observed as institutions adapted to the challenges by implementing transformative measures. These actions included adopting distance education, efforts to enhance access and equity, initiatives for quality training, diversification of courses, teacher professional development, and securing financial resources to adapt to the evolving educational landscape. Recognizing the significant impact on millions of students, particularly the vulnerable, UNESCO (2023) emphasizes setbacks in achieving the SDGs of the 2030 Agenda and underscores the importance of recovery efforts.

Regarding the hypothesis, results from Hypothesis 1 indicate that increased cooperation between employees and employers at the national level is associated with improved sustainable performance in HEIs. CME countries, with a score of 74.33, generally outperform AOE (68.18) and EME (59.87) on average. Studies by Baldini et al. (2018) and Jensen & Berg (2012) suggest that solid worker protection in countries leads to HEIs providing more significant social support, attracting qualified individuals, and fostering an environment conducive to sustainable performance. The HCE cluster poses significant challenges for HEIs aiming for a high sustainable ranking score. This challenge is attributed to the high coordination in the labor market, characterized by unique features in Japan, such as low labor mobility and a lifelong job concept within Japanese companies (Konishi & Ali, 2007).

Notably, all AOE countries showed no scores in the Bargaining Coverage indicator. This observation aligns with Taha et al.'s (2023) findings, emphasizing emerging challenges in the Arab region, including those exacerbated by the COVID-19 outbreak, oil price volatility, and structural economic issues. In contrast, liberal economies such as LME and EAC, despite having low bargaining coverage scores on average, perform exceptionally well on SDG 8. This aligns with Hall and Soskice's (2001) emphasis on American employers seeking labor cooperation in new collective bargaining and cooperative plant structures.

The results for Hypothesis 2 reveal a positive correlation between higher economic freedom and increased sustainable performance in HEIs. This finding is consistent with Jalloh (2015), who, in a study examining the relationship between stock

market capitalization and economic growth in African countries, provided additional evidence supporting the positive impact of economic freedom. Environments characterized by lower state intervention in the economy, as exemplified by clusters like Liberal Market Economies (LME) (18.33<sup>\*\*\*</sup>) and East Asian Developmental States (EAC) (17.27<sup>\*\*</sup>), demonstrate a significant association at a 0.05 significance level. The consistent findings, employing the Freedom Economic Index and Overall Score, affirm a positive relationship between economic freedom and sustainable development.

Economic freedom, built on factors like property rights, business freedom, and freedom from corruption, is closely tied to effective national governance and human development. Corruption impacts a country's capital markets, affecting credibility and increasing investment discount rates, as noted by Khumawala and Ramchand (2005). Corruption raises capital costs for firms, making it challenging to secure funding. Some countries face challenges like US sanctions, general embargoes, and economic sanctions imposed on nations with poor human rights records, engaged in nuclear weapon programs, or lacking diplomatic relationships (Taskinsoy, 2022).

Results for Hypothesis 3 reveal that increased local competition among HEIs positively influences sustainable performance. The average New Business Density (NBD) indicator across clusters is 4.11, with top-performing clusters LME and EAC averaging 12.73 and 25.71 in NBD. This indicates a 76.71% correlation between NBD and the overall sustainable score, supported by a highly significant random model at 0.01 (0.94<sup>\*\*\*</sup>). The top five countries in NBD are Hong Kong (25.71, EAC), the United Kingdom (17.76, LME), New Zealand (16.31, LME), Australia (15.25, LME), and Chile (12.12, AEE). The strong correlation between high new business density and economic development underscores the vital role of new businesses in fostering economic growth, job creation, and innovation. Hong Kong's leading position reflects China's openness to businesses contributing strategic value, particularly in high technology and infrastructure. Policies promoting business activities positively correlate with new business density in countries like Switzerland, Austria, Uruguay, the United Arab Emirates, and the United States.

This aligns with Lazzarini (2015), who asserts that influential policymakers encourage entrepreneurial activity by leveraging local and external resources. However, entrepreneurs face challenges, with the government's inefficient regulations and high unionization negatively impacting new business activity, as evidenced by the strong correlation between bargaining coverage and new business density in Italy,

Austria, France, Belgium, and Sweden. These results suggest that institutional environments with intense local competition may prompt HEIs to enhance sustainable efforts as a competitive advantage, enabling them to enter new markets, gain legitimacy, and attract investments.

Results for Hypothesis 4 indicate a positive correlation between a higher level of human development in the country and the sustainable performance of HEIs. The correlation between the indicator expenditure on education over GDP and THE's overall score is 67.13%, and the correlation between the Human Development Index (HDI) and THE's overall score is 84.44%. The leader clusters, LME, EAC, and CME, invest significantly in education and human development, while SOE and EME clusters exhibit lower results. The Random model underscores the importance of investment in education, with a performance of 0.67\*\* and a significance of 0.05. Higher education and income levels may increase individual demands, pressuring HEIs to adopt more ethical behaviors. Investment in education and human development generally aligns with national governance. Outstanding HEIs' performance at THE's overall score correlates with sound educational investment and excellent governance performance.

Countries like New Zealand, Australia, Canada, the United Kingdom, and Ireland in the LME cluster show a strong correlation between education and THE's overall score of 77.15% and another strong correlation between governance and THE's overall score of 84.68%. Studies suggest that a well-educated population enhances civil society's capacity to monitor business activities, prompting HEIs to demonstrate a more significant commitment to the environment and various stakeholders (Roos & Guenther, 2020; Rauen et al., 2015; Souza et al., 2021). Saudi Arabia's top position aligns with the International Labor Force's report on productivity growth (ILO, 2022), emphasizing economic strategies in oil-dependent countries, diversification efforts, and the importance of aligning education investments with national development policies.

Raising productivity and upskilling the local workforce is important for sustained economic development and improved living standards. SDG4 and SDG8 reflect the common need for skilled local forces in rapidly growing economies (EAC and AOE) and the requirement for an upskilled young local workforce to maintain competitiveness in mature industries (CME, EPE, and LME). These results align with prior research indicating that countries with well-developed educational systems and individuals with higher education levels tend to have a heightened awareness of SD

and greater expectations regarding corporate social responsibility (Alejandro-Cruz et al., 2019). Consequently, in countries with a higher Human Development Index (HDI), managers may have better access to education, influencing decision-making in favor of improved SD.

Results for Hypothesis 5 reveal that HEIs demonstrate improved SD in countries with superior national governance. The average governance across all clusters is 0.39, with the top three groups, CME, HCE, and LME, performing 1.59, 1.32, and 1.29, respectively. The bottom three countries, SOE, EME, and AOE, perform at -1.83, -0.43, and 0.12. The correlation between the average governance and THE's overall score is 86.12%, indicating a strong correlation. The top five countries in governance are Finland (1.74, CME), Norway (1.71, CME), Denmark (1.70, CME), New Zealand (1.69, LME), and Switzerland (1.69, CME). Finland's top position aligns with Sotarauta & Beer's (2017) findings, emphasizing the robust public sector and the decisive role of local government in Finland, fostering comprehensive opportunities for potential leaders and professionalizing leadership necessary to implement SDGs. Pinheiro et al. (2023) emphasize that governments can shape national characteristics to promote ethical behavior in HEIs, with better conditions fostering local competition, combating corruption, and indirectly encouraging corporate commitment to environmental issues through transparent governance environments.

Furthermore, the random model underscores the importance of governance with a positive coefficient of 4.12\*\*\* and a significance of 0.01. This result is consistent with earlier studies, highlighting that countries with higher government effectiveness and economic freedom empower investors to demand responsible behavior from firms through democratic mechanisms (Mathur & Singh, 2013). In this context, the top three SDGs in Japan's analysts are 17, 3, and 9. SDG 17 is obligatory for all HEIs, and SDG 3 is expected due to the global impact of the COVID-19 pandemic. SDG 9 appears in the top three, related to industry, innovation, and infrastructure. This is relevant to our analysis because an efficient governance context attracts investment in industry, innovation, and infrastructure (Lazzarini, 2015). Similarly, the German case is nearly identical, with SDG 17 and 3 in top positions and SDG 13 related to global climate change. Germany is actively transitioning to a renewable energy matrix, aiming to replace the current energy matrix with cleaner alternatives (Stirling, 2014).

In summary, the sustainable performance of HEIs is intricately linked to the quality of national governance, corroborating Almaqtari et al.'s (2023) findings that

nations with elevated SDG scores demonstrate improved overall country-level governance. This positive impact on sustainable performance is statistically significant, as evidenced by governance featuring a positive coefficient of 4.12\*\*\* and a significance level of 0.01 in the random model. Consequently, HEIs in countries characterized by high corruption levels, such as Emerging Economies (EMEs), and deficiencies in enforcement and legal effectiveness may face challenges in prioritizing sustainable initiatives.

One potential factor contributing to the governance challenges in Emerging Economies (EMEs) and Socialist Economies (SOEs) could be the presence of institutional voids. As Aray et al. (2023) highlight, these markets exhibit significant institutional voids, providing opportunities for innovative sustainable solutions and formidable barriers for companies operating within them. This is particularly relevant to emerging economies (EMEs), given their substantial representation in the number of HEIs and their growth potential. Hence, understanding the voids in the institutional environment's conditions becomes essential for HEIs to enhance sustainable performance in global rankings.

As previously emphasized by Khanna et al. (2005) and Khanna & Palepu (1997), Institutional Voids involve grappling with the absence of regulatory bodies in product, labor, and capital markets, contending with a lack of formal regulation and contract enforcement systems (e.g., due to corruption), and addressing a shortage of quality intermediaries. In a broader context, institutional voids represent conditions where institutional support for proper market functioning is weak, deficient, or non-existent (Mair & Marti, 2009). Institutional theory underscores the broader normative structures within society that legitimize the existence of organizations and, in specific cases, highlights the significance of institutions such as ownership and contract enforcement in business operations (Scott, 2008); conversely, institutional voids can be seen as the antithesis of such supportive conditions (Aray et al., 2023).

In emerging markets, the absence of robust informal institutions encompassing norms, values, beliefs, and societal expertise is a considerable hindrance to HEIs implementing sustainable initiatives and programs (Ghinoi et al., 2020). As Khanna & Palepu (1997, 2010) highlighted, the pronounced institutional voids in these markets are exacerbated by the lack of essential intermediaries crucial for effective market transactions, including entities like mass media and academia that can provide guidance and focus. Addressing these voids necessitates the application of network

'void-filling mechanisms.' For instance, HEIs can facilitate interactions between practitioners and researchers, foster cooperative educational training, and engage in lobbying efforts (Ghini et al., 2020; Parmigiani & Rivera-Santos, 2015).

Moreover, Aray et al. (2023) underscores the impact of institutional voids, particularly the lack of trust, resulting in resistance from key stakeholders (government, business, and society) against sustainable initiatives. Proactive behavior of HEIs and assuming responsibilities to fill these voids are recommended, emphasizing collaboration with a strong, experienced, legitimate partner. The author suggests comprehensive and transparent information disclosure about HEI activities and partnerships, open dialogue with critical stakeholders involving institutional partners, stepwise (incremental) integration/implementation of sustainable initiatives with support from legitimate partners, and the assessment and reporting of intermediate results to key stakeholders (Aray et al., 2023).

The academic implications of this analysis are also noteworthy. Firstly, it affirms the relevance of the VoC approach, highlighting that the institutional context, reflecting specific capitalist characteristics in a country, influences HEIs' sustainable performance. Organizational behavior aligns with a country's adopted typology of capitalism, driven by its institutional logic (Zysman, 1994; Morgan et al., 2005). The study underscores the intrinsic link between sustainable organizational success and the quality of the organization's relationship with its institutional environment, suggesting that HEIs mirror their operational and institutional environment characteristics. Furthermore, this study marks the initiation of research into the sustainable performance of HEIs in global sustainable rankings, considering the mediating influence of external forces stemming from the institutional dimensions of their respective countries. It also underscores a challenge, echoing findings from previous studies (Razak et al., 2013; Lauder et al., 2015; Davey, 2017; Galleli et al., 2021), to align methodologies with global sustainable rankings for a comprehensive understanding of HEIs' performance and to effectively identify advancements made in favor of sustainable development.

Secondly, the study enhances understanding of how national institutional dimensions in different forms of capitalism, such as relations between employees and employers, economic freedom, local competition intensity, the Human Development Index (HDI), and national governance quality, influence the sustainable performance of HEIs in global sustainable rankings. This contributes to a deeper understanding of

the association between sustainable performance and capitalism characteristics in less explored country contexts.

The study advises HEI managers to consider a country's macro institutional environment when deciding on sustainable performance initiatives. Aligning with specific capitalism characteristics can enhance legitimacy, improve global sustainable rankings, and attract students engaged with the SDGs and investments for SD actions. National governments can leverage these findings by promoting favorable national characteristics, such as higher income levels, education, health conditions, local competition, transparent and agile business environments, and effective anti-corruption measures. Transparent governance indirectly contributes to HEIs, demonstrating a more significant commitment to SD.

The study emphasizes that HEIs operate and conform to their countries' institutional environment. Governments are encouraged to incorporate regulatory mechanisms protecting diverse interest groups, not just shareholders. For effective SD strategies, HEIs need to align with government actions. Governments fostering economic freedom, high human development, and excellent national governance set a positive example, encouraging micro-government actions that, on average, improve the country's performance in global sustainable rankings.

### 5.1 How sustainable performance of HEIs behaves over time

In Figure 1, we examine the sustainable performance of HEIs across a five-year span, revealing the notable impact of COVID-19 in 2020, which widened the gap between lower-ranking institutions. This observation suggests a growing influence of rankings on HEIs, with administrators and leaders responding to them and integrating them into policy decisions (Hazelkorn, 2008; Locke, 2011). This trend is reinforced by the positive correlation between strategic management practices, competitive advantage, and organizational performance (Salvador, 2013; Locke, 2011), indicating mimetic institutional behavior among HEIs characterized by consistent managerial and leadership approaches across different countries (Hamlin, 2017).

## 5.2 Components of the sustainable performance of HEIs

This research reveals that Higher Education Institutions (HEIs) worldwide actively demonstrate their commitment to sustainable development through diverse performance components, establishing them as pivotal contributors to global sustainability. Environmental sustainability is a prominent dimension, with HEIs implementing eco-friendly initiatives and sustainable practices, encompassing the adoption of renewable energy sources, responsible waste, water, and soil management, and the promotion of innovation aligned with sustainable development goals (Atici et al., 2021; Leal Filho et al., 2019; Puertas & Marti, 2019). These initiatives signify institutions' dedication to ecological responsibility and equip students to navigate evolving sustainability dynamics in the job market (Puertas & Marti, 2019).

Another crucial aspect is social responsibility, as HEIs emphasize diversity, equity, and social justice, fostering inclusive environments, engaging with local communities, and contributing to social cohesion and well-being (Littledyke et al., 2013; Leal Filho et al., 2019). Economic contribution also plays a significant role, with HEIs managing finances responsibly, promoting entrepreneurship, and collaborating with organizations for sustainable economic growth (Puertas & Marti, 2019; Nielsen et al., 2020). Through these multifaceted components, HEIs leverage their academic, economic, and social influence to shape a sustainable future, aligning their efforts with global objectives and enhancing their positions in international rankings. Furthermore, these actions are closely tied to their respective institutional environments, as organizational behavior aligns with the typology of capitalism adopted by a country, driven by its institutional logic. This underscores the correlation between organizational success and the quality of its relationship with its institutional environment, as demonstrated in quantitative analysis.

## 5.3 National institutional dimensions that influence sustainable performance

This research underscores that various national institutional dimensions significantly influence the performance of Higher Education Institutions (HEIs) in global sustainable rankings. Specifically, labor, finance, intercompany relations, education, and national governance are relevant dimensions, collectively contributing to an adjusted R-square of approximately 28% and individually presenting an adjusted R-

squared of around 20%. Drawing on insights from prior studies that highlight the critical role of institutional dimensions such as human development, economic freedom (market), and national governance in fostering overall progress and development within countries, thereby creating a conducive environment for sustainable development (Kabir & Alam, 2021; Rhee, 1997; Audretsch & Thurik, 2000; Wittman, 1989; Rontos et al., 2013; Ocampo, 2006; Pourgerami, 1988; Kaufmann, 2006), this research specifically emphasizes the dimensions of education, finance, and governance as particularly extremely significant in creating the quality of the environment in which HEIs took actions toward SD, performing in global sustainable rankings.

#### 5.4 Framework proposal

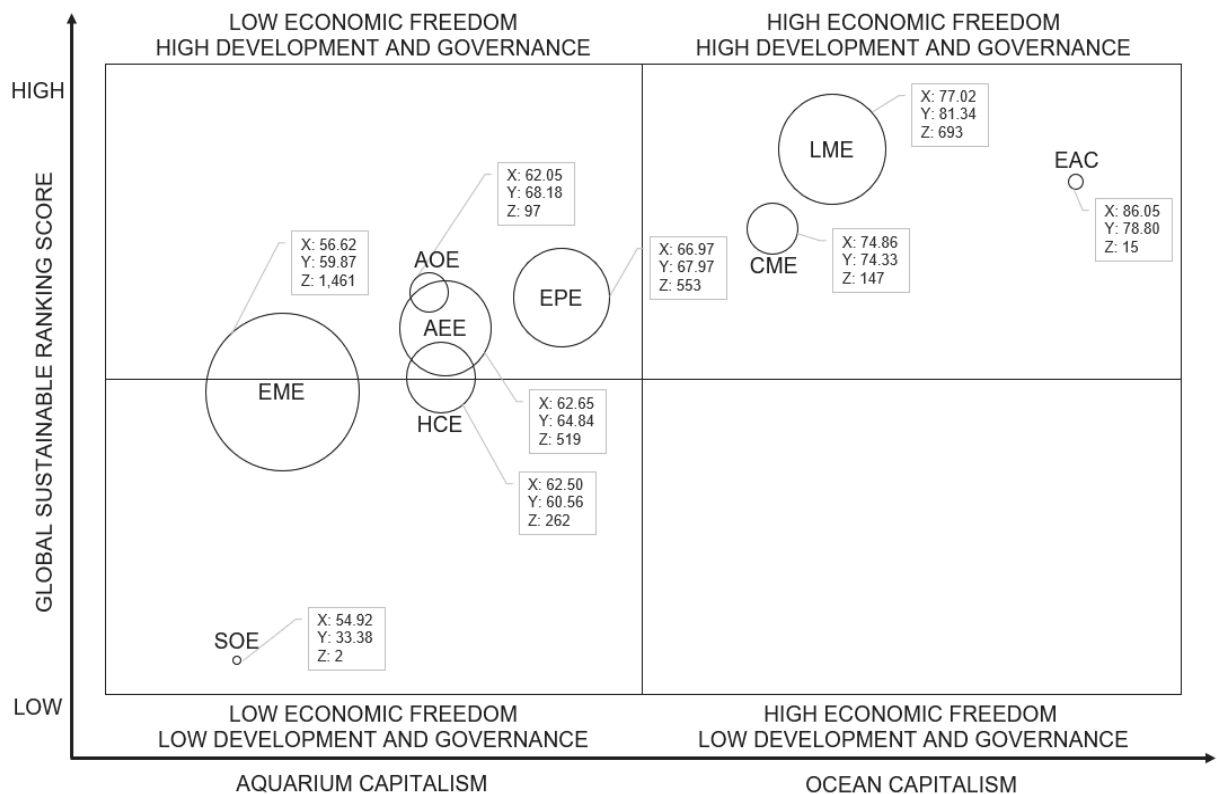
From the results and discussion, we have crafted an analytical framework to assess the sustainable performance of HEIs in various institutional contexts within global sustainable rankings. Unlike conceptual frameworks based on theoretical concepts, analytical frameworks rely on observed data and empirical evidence, providing a structure for analyzing real-world data or observations (Rodríguez-Castro & Aparicio, 2021). Our approach relies on the random model selected through the Hausman test, incorporating coefficients derived from this model.

The equation, derived from econometric model coefficients and the respective VoC country dimensions, is represented on the horizontal axis (X). The coefficients originate from the general model analysis. The X-results are determined by the formula "Sustainable performance = Intercept (58.83774) + Bargaining Coverage (0.078478) \* (current cluster results in this indicator) + Market Capitalization Of Domestic Companies (0.02893) \* (current cluster results in this indicator) + New Business Density (0.936241) \* (current cluster results in this indicator) + Expenditure On Education Over GDP (0.669081) \* (current cluster results in this indicator) + Governance Total (4.116628) \* (current cluster results in this indicator) + Log GDP (-0.704053) \* (current cluster results in this indicator).

The placement of VoC in the upper or lower quadrant is determined by their corresponding HEIs' Times Higher Education average scores (Y). The circle size (Z) also reflects the number of HEIs in the respective VoC. The X, Y, and Z plot is illustrated in the framework, indicating a reasonable and fitting alignment with actual

HEI scores in the global ranking, as depicted in Figure 10, with an observed Adjusted R-squared of approximately 28%. Which appropriately acknowledges the model's suitability, considering its substantial complexity. From this equation, we formulated the following framework for analyzing the sustainable development of HEIs in global sustainability rankings.

**Figure 10 - The framework for evaluating HEIs' sustainable performance.**



**Source:** The authors' work (2024).

The analytical framework classifies HEIs into four quadrants based on global sustainable ranking scores (y-axis) and the country's level of economic freedom (x-axis). We term economies where government coordination surpasses economic freedom as "aquarium capitalism," characterized by formal institutions regulating interactions between companies and stakeholders. Conversely, "oceanic capitalism" characterizes free-market economies with greater economic freedom, minimal government involvement, stock market financing, and a decentralized industrial relations system.

Ocean capitalism, interwoven with economic freedom, provides entrepreneurs with diverse business opportunities, influenced by thought leaders such as Karl

Popper, Friedrich Hayek, Milton Friedman, and Thomas Sowell, who advocate individual liberty, the "spirit" or "ethic" rooted in Weber's Capitalism, and limited government intervention (Popper, 2020; Vargas & Marques, 2022; Friedman, 2016; Sowell, 2014; Hall & Soskice, 2001; Williamson, 1985; Max Weber, 1958). This connection between ocean capitalism and influential figures sets the stage for understanding the dynamics of economic systems in the context of the ocean and its challenges and opportunities.

Countries embracing the capitalist economic system with entrepreneurial freedom, a free price system, and emerging values experience substantial societal benefits, remarkably when grounded in democratic systems promoting transparency and efficiency in national governance (Kabir & Alam, 2021; Rhee, 1997; Audretsch & Thurik, 2000; Wittman, 1989). This realization brings attention to the critical institutional dimensions of Human Development, economic freedom (market), and national governance, closely linked to democracy, as pivotal for the progress and development of countries (Rontos et al., 2013; Ocampo, 2006; Pourgerami, 1988; Kaufmann, 2006). Given the dynamic nature of social challenges, continuous improvement in these institutional dimensions is imperative for addressing evolving challenges, and ocean capitalism represents the right quadrants in this framework where these countries are positioned.

Aquarium capitalism symbolizes coordinated efforts among stakeholders, shaping the business environment and reflecting an aquarium's aesthetic appeal. Coordinated market economies heavily rely on non-market relationships, often exhibiting power imbalances and a lack of trust. Intensified collaboration between labor and management can prompt new coordination forms influenced by globalization, heightened competition, and outsourcing strategies (Svensson, 2005; Thelen, 2006).

In economic systems, the Coordinated Market Economies (CME) cluster, conceptualized by Hall and Soskice (2001), represents a distinctive model characterized by intricate economic structures and a higher degree of government involvement. We propose this economic model as aquarium capitalism, where the overseeing authority closely monitors and regulates various economic ecosystem elements. Unlike the open seas of Liberal Market Economies (LME), where economic initiatives navigate freely, the CME aquarium is carefully curated, resembling a controlled environment where economic actors swim through a complex network of regulations and collaborative relationships.

Within the aquarium capitalism, countries exhibiting CME characteristics, such as Germany, Denmark, Finland, and Sweden, showcase a unique economic landscape. The metaphorical aquarium walls symbolize the intricate network of regulations, coordinated efforts, and interdependence among crucial economic players (Maggetti, 2014); Lee et al., 2012). The water, representing the economic environment, is denser with institutional arrangements and collaborative practices, making it more challenging for entrepreneurial initiatives to navigate freely (Lee et al., 2012). The metaphor emphasizes that in CMEs, or any economy with greater coordination, the economic actors are akin to fish navigating a regulated aquarium, where coordinated efforts and governmental influence shape the currents (Hustedt & Danken, 2017; Thompson & Zumeta, 1981).

Moreover, in aquarium capitalism, the role of governments looms larger, akin to caretakers overseeing the well-being of the aquatic ecosystem. These governments act as stewards, carefully tending to the economic conditions, promoting collaboration, and ensuring the equilibrium of the aquarium (Samson, 2015). The metaphorical analysis underscores that in CMEs, or any economy with greater coordination, the dynamics between economic actors and government entities are more interconnected, reflecting a symbiotic relationship where governmental influence is essential for maintaining balance and SD within the economic aquarium (Bronkhorst, 2020; Samson, 2015). In contrast to the vast and open waters of liberal economies, the aquarium capitalism metaphor serves as a pedagogical tool to illustrate the nuanced, regulated, and interdependent nature of national economies. Aquarium capitalism represents the left quadrants where these countries are positioned in this framework.

In the lower left quadrant, coordinated markets with low development and governance are found in countries where formal institutions regulate market activities and interactions among firms and stakeholders. These countries exhibit low performance in Human Development and Governance. The upper left quadrant represents coordinated markets with high development and governance, found in countries with formal institutions regulating market activities, where they perform highly in Human Development and governance. Moving to the lower right, free markets with low development and governance are encountered. These countries finance operations significantly through the stock market and have a relatively decentralized industrial relations system, exhibiting low performance in Human Development and governance. Finally, the upper right quadrant represents free markets with high

development and governance, characterized by significant stock market financing and a relatively decentralized industrial relations system, also exhibiting high performance in Human Development and Governance.

This framework should be interpreted within the current temporal context of its indicators. It enables HEI managers, sustainability-focused organizations, and NGOs to discern the impact of their institutional environment's quality on sustainable development efforts. This diagnostic tool provides valuable input for calibrating efforts to enhance sustainable performance. An HEI situated in an EME cluster, for instance, would need a more substantial effort to attain an optimal score in global sustainability rankings compared to an HEI in an LME context. Conversely, governments, public managers, and policymakers can leverage this framework to inform decisions, prioritizing actions that positively influence and drive sustainable development in their respective countries.

This framework is tailored for diverse audiences, including the academic community, HEI managers, public managers, and stakeholders involved in SD actions. The framework is valuable for academics, offering insights into SD challenges within institutional contexts and guiding future research. Rooted in classifications by Hall & Soskice (2001) and Witt et al. (2018), it illuminates the current sustainable performance of HEIs across different clusters, revealing disparities between LME, CME, and EPE compared to EME and SOE in SDG performances.

The framework's relevance for HEI managers extends beyond well-intentioned plans, emphasizing a holistic approach that integrates environmental management, social responsibility, and economic prosperity for sustainable development. Embedding sustainable practices into HEIs' processes, strategies, and long-term visions is crucial for sustained success and competitiveness. The study highlights the vital role of economic freedom, robust human development, and national governance in achieving positive outcomes for SDGs. This correlation is evident in countries like New Zealand, Australia, the United Kingdom, Hong Kong, Germany, and Austria, where high human development, civil liberties, economic freedom, and press freedom positively impact HEIs' sustainable performance.

The framework also emphasizes that HEIs, with distinctive features, integrate SDG actions into strategic and routine activities, underlining the importance of considering the national institutional effect in comparative performance studies. HEIs undertaking SD strategies must navigate the complexities of their institutional

environment. The effectiveness of these strategies is significantly influenced by the specific cluster and its institutional dimensions (Hall & Thelen, 2009).

The competitive landscape varies based on the rules set by these dimensions, necessitating careful consideration for HEIs aiming to maximize their sustainable performance. When evaluating what constitutes the "best university" and endeavors toward SD, a crucial factor is the institutional environment within which the university operates. Hence, the institutional dimensions of clusters serve as the defining rules of the competitive game, where HEIs strive to excel in sustainable actions within the framework defined by these dimensions (Hall & Thelen, 2009; Carney et al., 2009).

An epistemological challenge arises in the context of a global measurement unit. Examining sustainable performance on a global scale brings forth the challenge of extrapolating findings from distinct regional clusters to a broader scope. The intricacies involved in understanding and interpreting social phenomena across varying scales raise questions about the dependability and validity of such generalizations, emphasizing the necessity to capture the diversity and specificity inherent in regional contexts (Ebert et al., 2021; Deffner et al., 2021). This study elucidates HEIs' sustainable performance in global sustainable rankings, underscoring the significance of unique dimensions within the clusters. It stresses the importance of acknowledging and considering the institutional aspects of clusters, which markedly influence the performance of HEIs in global sustainable rankings. As Pache and Santos (2010) noted, organizations grapple with mounting pressures from conflicting demands within their institutional environments, prompting organizational responses that navigate intra-organizational and national political processes. Consequently, any discourse on determining the "best university" requires a profound understanding of the institutional dimensions to which it inherently conforms. This constitutes the central theme emphasized in this dissertation.

This study considers sustainable performance for HEIs based on their actions toward SD, recognizing that HEIs operate within the context of pursuing sustainable performance in global rankings and academic and organizational performance for survival in the capitalist economic environment. The analysis framework, tailored to the unique reality of HEIs, can offer insights for companies with caution. Adapting and considering necessary adjustments is crucial, as sustainable performance differs from organizational performance. While the framework may assist firm managers in gaining

a better understanding of their sustainable performance within their institutional context, it is essential to acknowledge the distinction between the two aspects.

Moreover, the framework extends its utility beyond the corporate sector. Governments can leverage it to assess and compare economic freedom and regulatory quality among countries, fostering an environment conducive to sustainable investment, development, and energy infrastructure. As a monitoring tool, the framework aids governments in evaluating their sustainable performance and the evolving institutional environment. It provides insights into how these factors facilitate or impede decision-making aligned with SDGs. This multifaceted framework is valuable for HEIs, offering tailored perspectives on sustainable performance within distinct institutional logics.

Finally, in navigating this complex global landscape, the framework presented also serves as a valuable tool, offering insights that extend beyond the scope of the traditional responses to global challenges. It emerges as a crucial resource for HEI managers, governments, CEOs, and managers of multilateral organizations, providing a nuanced understanding of the sustainable performance of their organizations in global sustainable rankings. This comprehension becomes particularly vital in contemporary times, marked by escalating tensions worldwide (Mbah & Wasum, 2022). The framework contributes to informed decision-making, facilitating strategic actions that align with the imperatives of sustainable development amid the current global uncertainties.

## 6 CONCLUSION AND IMPLICATIONS

Our study, based on the theoretical framework proposed by Hall and Soskice (2001) and revisited by Witt et al. (2018), analytically explores the relationship between the sustainable performance of HEIs and national institutional dimensions on the sustainable performance of 3,749 HEIs across 59 countries. The findings reveal that it influences capitalism's national institutional dimensions and significantly influences HEIs as they conform their actions toward SD to the national institutional context.

This research is marked by its innovation and scientific robustness, leveraging a substantial volume of data and employing a dual model analysis technique. By scrutinizing the sustainable performance of HEIs through the lens of national institutional contexts, this study provides a unique map reflecting the composition of institutional dimensions in 93.79% of the global economy. This novel approach contributes significantly to understanding how diverse national institutional contexts elicit distinct responses in the sustainable performance of HEIs, as evidenced by their scores in global sustainable rankings. The findings, representing an unprecedented exploration of HEIs' sustainable performance across various institutional contexts, lay the groundwork for potential fine-tuning and extension to other geographical regions in future studies.

The results of this study, focusing on the 2030 agenda, extend beyond its temporal confines, with the 2030 agenda serving as a reference and the Sustainable Development Goals (SDGs) providing a framework for sustainable development. In analyzing the sustainable performance of Higher Education Institutions (HEIs) in global sustainability rankings, we observed that organizational behavior aligns with a country's adopted typology of capitalism, influenced by its institutional logic (Zysman, 1994; Morgan et al., 2005). The study emphasizes the intrinsic connection between sustainable organizational success and the quality of an organization's relationship with its institutional environment, suggesting that HEIs mirror the characteristics of their operational and institutional surroundings. In essence, this goes beyond capitalism, as the quality of the institutional environment is shaped by the prevailing logics during that period. Therefore, these findings will remain pertinent for analyzing the sustainable performance of HEIs in global rankings even after 2030.

In countries characterized by higher economic freedom, intense business competition, substantial human development, and solid national governance, HEIs

should invest more resources in sustainable actions, addressing the diverse needs of business stakeholders. From the framework proposed, organizations under the influence of ocean capitalism tend to fare better in sustainable actions than those influenced by aquarium capitalism. High sustainable performance is particularly advantageous in an environment of high-quality, free-market economics instead of a heavily regulated one. Therefore, it is essential to highlight that the simultaneous consideration of high levels of human development and governance is essential for an optimal environment of economic freedom.

It is essential to acknowledge the limitations of our findings. We only account for just over 28% of the phenomenon, which is a well-appropriate recognition given its high complexity. While our sustainable performance framework prioritizes VoC institutional dimensions, future studies could explore alternative approaches, such as incorporating the degree of democracy in countries to evaluate organizations' sustainable performance levels. Additionally, notable limitations include the analysis of a single sustainability ranking, which relies on voluntary submissions and focuses solely on the top three Sustainable Development Goals (SDGs), with variations in the criteria among HEIs. It is essential to acknowledge the diversity of HEIs' origins (private, public, and third sector), each with its distinct characteristics and internal resources that contribute to varied performance outcomes when combined with external resources. Moreover, the study recognizes that the Varieties of Capitalism (VoC) perspective cannot draw inferences related to agency. To address this limitation, we recommend expanding the research scope by incorporating additional theories to comprehensively analyze the phenomenon.

Future research should extend its focus to understudied contexts, particularly Latin America and Africa, to enhance our understanding of the sustainable performance of organizations. Additionally, researchers should delve into the influence of both formal and informal institutions, such as culture, religion, and values, in elucidating sustainable performance dynamics. To capture the intricacies associated with HEIs, future studies may adopt a nuanced approach by separately analyzing the sustainable performance of private and public HEIs, aiming to identify both similarities and divergences in their rankings. Exploring questions related to the characteristics that enhance or impede the performance of private/public/third-sector HEIs in global sustainability rankings could offer valuable insights. Moreover, researchers are encouraged to broaden the analytical perspective beyond Varieties of Capitalism

(VoC) and consider alternative frameworks like Agency theory. This shift can aid in addressing pivotal questions regarding how HEIs can attain high scores in global sustainability rankings and identifying the influential agents behind critical decisions impacting sustainable performance. Finally, from a broad perspective, future studies should focus on analyzing the institutional logics that influence organizations in specific contexts, aiming to understand the role of institutional logic at organizational, national, and global levels in conforming to organizations' actions and strategies, particularly on the sustainable performance of HEIs.

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