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THE ROLE OF SECTOR-SPECIFIC SDG POLICIES, GOVERNANCE QUALITY AND FINANCE FOR SDG PROGRESS

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ABSTRACT. This study examines the role of three country-level factors for progress on SDGs in agri-food and financial sectors across 167 United Nations Member States. First, the role of governance quality in terms of three governance indicators (government effectiveness, regulatory quality and rule of law); second, the role of financial support from government and banks; and third, the role of sector-specific SDG policies. The results from PLS-SEM and panel regression analyses indicate that sector-specific SDG policies have a statistically significant but minimal impact on SDG progress. Governance quality is positively associated with SDG progress, with high-income countries relying more on governance effectiveness and regulatory quality, and low-income countries relying on the rule of law. We have weak evidence that increasing bank credit to the agri-food sector boosts SDG progress, especially in lower-middle-income countries. Implications for policymakers aiming to enhance SDG progress arise from the need to improve governance quality.

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Introduction

In the current geopolitical context characterized by polycrisis, progress towards the UN 2030 Sustainable Development Goals (SDGs) is slowing down (Steiner & Makarenko, 2026). Yet parallel to this development we can observe that sector-specific sustainability policies implementation can vary by sector as a function of governance forms (Ponte & Gibbon, 2005; Gupta et al., 2019), and that the financial gap for achieving the SDGs has increased considerably relative to pre-Covid levels (Arora & Sarker, 2022; Shulla & Leal-Filho, 2023). Thus, how are these matters related and what does cross-country evidence tell us on these matters – SDG achievement, governance indicators, finance gap - from a sectoral perspective, keeping cross-sector interconnections in mind (Alcamo et al., 2020)? The aim of this paper is thus to explore how sector-specific sustainability policies, governance indicators, and country-level financial support relate to SDG progress in the agri-food and financial sectors worldwide.

Prior to the inception of the SDGs in 2015, the Organization of Economic Cooperation and Development (OECD) claimed that environmental, social and governance (ESG) disclosure was already important and addressed through available instruments for corporate responsibility (OECD, 2014). Yet the United Nation's (UN) Addis Abeba's action agenda acknowledged the need for further action by emphasizing the synergy between the corporate and financial sectors for SDGs achievement (UN, 2015). Since then, more than 730 changes have been made to ESG and sustainability policies in the world's 50 largest economies over the last decade (UN PRI, 2023), and a 33% increase in various policy types related to SDGs has been detected (UN PRI, 2024), which are challenging corporate disclosure. Despite the fast-growing number of SDG related policies worldwide, only 18% of the SDG targets are currently on track (UN, 2025). Among the most urgent priorities are addressing SDGs 1 and 2 (Sachs et al., 2024), reforming the financial sector architecture and overcoming the SDG investment gap in developing (low-income) countries, which now stands at $4 trillion per year, compared to the pre-estimated $2.5 trillion (UN, IATFFD, 2024). High-income countries with higher levels of resource efficiency, food safety and environmental awareness should not only contribute to overcoming their own challenges relative to SDG 1 and 2 (balanced diets, food waste generation, balancing food and biofuel production, developing fair agricultural policies) but also support policies aimed at favouring low- and medium-income countries (Movilla-Pateiro et al., 2021) towards global SDG progress. These two SDGs are noteworthy also since they are primarily associated with the agri-food sector, where $ 0.3 trillion is needed to eliminate extreme poverty and hunger annually by 2030 (UN, IATFFD, 2024), which is equivalent to 0.31% of global GDP (UN FAO, 2023). However, to fill the required financial gap, the financial sector would have to align with the SDGs by standardizing SDG reporting, assessing risks and opportunities, and developing financial products, while governments would have to align regulations and policies with SDGs and financial sector needs (Taghizadeh-Hesary et al., 2022). Recent research also underlines that sustainable finance instruments are crucial for supporting progress towards the SDGs (Streimikiene et al., 2023; Nassar et al., 2023).

Considering both mandatory and voluntary sector-specific sustainability policies in the agri-food and financial sectors, which for example includes the EU's Green Deal (EC JRC, 2025), EU's Sustainable Finance Disclosure Regulation (SFDR), the US SEC climate-related disclosure rules and Voluntary Sustainability Standards (VSS), we observe governance efforts to incorporate SDGs into business activities. At least 74 % of G250 companies use SDGs as a basis for their sustainability disclosure. However, only 8 % of those companies use a balanced approach for SDG disclosure, communicating both the positive and negative impacts on SDG progress (KPMG, 2024).

Despite such communication efforts of businesses through sustainability reporting and SDG promotion in business operations, and despite the obvious global climate crisis and human development gaps, why else do we need to intensify SDG progress and research on the matter? First, the effective implementation and transformative potential of the SDGs is undermined because key knowledge gaps remain in terms of the assessment of interlinkages, trade-offs and synergies between SDG targets (Allen et al., 2018). Second, there is increasing evidence for greenwashing and different 'washing' practices linked to SDG disclosure (del Río et al., 2024). This is a reflection that companies are symbolically trying to legitimize their operations (Silva 2021; Costa et al., 2025) by some level of SDG-related investment while not fully disclosing the remaining negative aspects associated with SDG achievements (Manes-Rossi & Nicolo, 2022). In a study that systematically analyzes ESG/SDG-related disclosures from firms across multiple sectors, Ittipornpaisarn and Sae-Lim (2025) find that while disclosure is widespread, the reporting content often lacks depth or concrete performance-linked metrics — consistent with symbolic or legitimacy-oriented disclosure rather than substantive transformation. Their study is thus reflecting broader concerns in the literature about the "decoupling" of disclosure from actual organizational change (Aboud, 2024), while concluding that most disclosure is from the technology sector, the least is from the agriculture and food sector. So, considering the above evidence, as sustainability practices and policies are not always implemented effectively and transparently, governance quality becomes of central importance for transparently promoting and achieving SDGs progress. Governance quality can be understood broadly as "the traditions and institutions by which authority in a country is exercised", referring to the overall functioning of institutions, rulemaking and enforcement, public-sector capacity, and freedom / accountability (World Bank, 2024).

Previous work has employed the Worldwide Governance Indicators (WGI) to assess governance quality across multiple dimensions, including government effectiveness, regulatory quality, and transparency measured through "voice and accountability" and "control of corruption" (Kaufmann et al., 2010). Williams (2015) highlighted the broader relevance of the relationship between higher transparency and better governance outcomes, including lower corruption and higher economic growth. Yet we are missing sector-level evidence from sectors where we see large needs and potentials for achieving SDG progress through better governance, also due to their inter-dependence (Alcamo et al., 2020; OECD, 2018).

We aim to contribute to this gap by exploring how sector-specific sustainability policies in the agri-food and financial sectors, governance quality, and funding regarding sector-specific government expenditure vs. bank credit influence SDG progress. More specifically, we pose three research questions with SDG and country-level focus, distinguishing low- and high-income countries. First, what is the relationship between sector-specific SDG policies and SDGs progress in agri-food and financial sectors (RQ1)? In particular, what is the relationship between sector-specific SDG policies and a country's overall SDG progress score in agri-food and financial sectors (RQ1.1.); what is the relationship between sector-specific SDG policies and sector-specific SDG progress score in agri-food and financial sectors (RQ1.2.); and what is the relationship between sector-specific SDG policies and the value added as percentage of GDP in a country's agri-food sector (RQ1.3.)?

Second, how does governance quality relate to overall and sector-specific SDGs score progress (RQ2)? And third, how does sector-level financial support from lenders like government and banks relate to overall and sector-specific SDG scores (RQ3)?

The remainder of the paper is structured following. Section 2 provides a short review of the current scientific debate on the role of sustainability policies in promoting SDG achievement in the agri-food and financial sectors with a focus on governance quality, sustainability transparency and funding support. Section 3 introduces the data, the models, and

summarises and discusses research results, while section 4 concludes and provides policy recommendations.

1. Literature review

1.1. Sector-level SDG contributions and the role of SDGs 1, 8 and 12

ESG, sustainability, SDGs, and corporate social responsibility policies broadly refer to mandates for reporting activities, risks and communication about sustainability issues (Christensen et al. 2021). Chalmers et al. (2023), define the sustainability (ESG) policy as a set of rules and regulations created by governments, regulators, international bodies, multi-stakeholder initiatives, professional bodies, or industry associations to encourage or require companies to adopt sustainable and ethical business practices. Importantly, this includes disclosure requirements, as well as the broader suit of ESG & sustainability policy initiatives, including guidelines and legislation (Chalmers et al. 2023, 15).

Research on sector-level SDG contributions is limited or fragmented, and yet sector-level work - especially linking agri-food and finance - is important because of their mutual interdependencies for achieving the SDGs (OECD, 2018). An SDG-related Scopus and WoS-based systematic literature review by Low et al. (2023) shows a scarcity of studies on business contributions towards SDGs in agricultural, fishery, and forestry sectors. Similarly, in the PRISMA-based review by Gyimah, Appiah & Appiagyei (2024), the financial sector is found to play a minor role as a separate cluster in SDGs research.

The editorial of Alcamo et al. (2020) on SDG interaction studies highlights important research gaps (including sectoral and scale mismatches) and calls for more analysis of interactions and trade-offs across sectors and scales because cross-sector interconnections critically shape SDG outcomes. Maniatakou et al. (2024) develop a sector-level SDG assessment heuristic using a traffic-light system, since they find existing sectoral SDG assessments are insufficiently scientifically anchored and lack transparency. Using the agricultural sector as a case, they illustrate spillovers resulting from SDG interactions. They argue that a sector-based approach is needed to guide investors and policymakers on sector-level SDG assessment, which is especially relevant when assessing agri-food and finance interactions.

The Food and Agriculture Organization of the United Nations (UN FAO, 2015) highlights that for the agri-food sector there is a specific set of most relevant SDGs: SDG 1: No Poverty, SDG 2: Zero Hunger, SDG 6: Clean Water and Sanitation, SDG 7: Affordable and Clean Energy, SDG 12: Responsible Consumption and Production, SDG 14: Life Below Water, SDG 15: Life on Land. In contrast, considering the European Banking Federation (EBF) and KPMG data survey evidence (EBF & KPMG, 2021) support the significance of SDGs 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) to the financial sector. Considering these most relevant SDGs for the agri-food and financial sectors, the academic landscape can be mapped by using predefined SDG-related research areas in SciVal by Elsevier (*Table 1*).

Table 1. Agri-food and financial sector SDG-related research area characteristics

SDG	Overall research output	% of BMA, EEF* papers	The largest research topic cluster by output
SDG 1	**116,156**	**35,3**	**Financial Inclusion; Banks; Finance**
SDG 2	328,825	7,5	Prevalence; Nutritional Status; Malnutrition
SDG 6	433,346	2,4	Chemical Activation; Sulfur Compounds; Advanced Oxidation Process
SDG 7	1,221,607	3,9	Electrocatalysts; Catalyst Activity; Oxygen Evolution
SDG 8	**439,836**	**37,6**	**Greenhouse Gas Emissions; Carbon Dioxide; Environmental Kuznets Curve**
SDG 11	569,468	8,2	Smart City; Sustainable Development; Internet of Things
SDG 12	**401,841**	**20,5**	**Sustainable Development; Environmental Impact Assessment; Circular Economy**
SDG 13	454,432	10,2	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst
SDG 14	228,624	3,5	Microplastics; Water Pollutant; Environmental Monitoring
SDG 15	302,600	5,3	Ecosystem Service; Land Use; Natural Resource

*BMA - Business, Management and Accounting, EEF - Economy, Econometrics & Finance
Source: *authors own elaboration using SciVal by Elsevier*

Table 1 shows that the largest percentage of papers in the areas of BMA and EEF were detected in the context of SDG 1, 8 and 12, highlighting current tendencies in SDG research. These three SDGs are important for several reasons in the context of agri-food and services sectors. In the case of the agri-food and financial sectors, sustainability contribution via policy efforts towards SDG 1 can be fostered by the financial inclusion of people in rural areas and better financial services for smallholder farmers (Steiner, 2025). In the case of SDG 8, sustainability policies are relevant to both sectors, as for example research on carbon border adjustment policies and EU emissions trading suggests (Bassi et al., 2025; Cludius et al., 2020). Transparency in sustainability practices (SDG 12) driven by sustainability policies is crucial for both agri-food and financial sectors, because such transparency in sustainability practices can support responsible consumption and production due to improving accountability and the flow of information that enables better policymaking, procurement and investments (Gardner et al., 2019; Christensen et al., 2021; Cuomo et al., 2022).

Considering the coverage of policy engagement in the context of SDG1, 8 and 12 (*Table 1*), we note that SDG 1 has very little policy engagement as visible in the Carrots&Sticks database (Chalmers et al., 2024). In contrast, SDG 8 and SDG 12 are the most prioritised by policymakers worldwide, with 1375 disclosure and 1193 other ESG and sustainability policies, and with 1059 disclosures and 811 policies, respectively (Chalmers et al., 2024).

1.2. SDG progress and governance quality

While the number of sector- and SDG-specific policies has been growing globally, and the literature puts special emphasis on metrics for SDG progress (Movilla-Pateiro et al., 2021), what does the literature say on SDG progress and transparency in the agri-food and financial sectors, in terms of sustainability communication and practices?

In terms of SDG progress with supporting ESG, the financial sector evidence is mixed. We have evidence that ESG can negatively affect the operational, financial and market

performance (Buallay, 2020; El Khoury et al. 2023; Schreiner et al., 2025). Other evidence suggests a low and heterogeneous contribution of ESG efforts to achieving SDGs in the financial sector (Avrampou et al., 2019).

A similar mixed situation is observed in the agri-food sector. Based on a study of 57 European-listed companies (EU28), Conca et al. (2021) identify a positive relationship between profitability and disclosure practices, suggesting that greater transparency and accountability helps to improve business profitability. However, Buallay (2021) suggest that there is no significant relationship between ESG and performance, only governance disclosure has a positive impact on market performance. Wang et al. (2025) show for the Japanese agri-food sector that ESG engagement is even negatively associated with net profits.

There seems to be consensus in the literature that governance quality elements (incl. corporate governance, non-financial regulation, and the external environment) are the main factors fostering business impact on sustainable development (Pizzi et al., 2020; Eccles et al., 2014; Kaufmann et al., 2010). Institutional quality is also crucial for enforcing sustainability policies to promote investments towards SDGs (Sethi et al., 2024). Democratic institutions and participation, economic power, education, and geographic location have been identified as key Sustainable Governance Indicators that serve to explain SDG achievement at the national level (Glass & Newig, 2019). However, the joint role of institutional quality and investment for the country-level sustainability has largely been overlooked (Bhat et al., 2024).

From the above evidence, we conjecture that overall governance quality can be considered a country-specific category that is vital for implementing and monitoring sustainability policies. The higher the country-level governance quality, the more efficiently could we expect financial resources to be allocated towards relevant SDGs, and in accordance with SDGs as well as sector-specific sustainability policy tasks. Vice versa, deficient institutional quality can be expected to impede countries' ability to profit from specialization and trade, especially in the case of developing countries where the agriculture sector is significant (Trakem & Fan, 2024; Steiner, 2025). Findings of Trakem & Fan (2024) about the role of governance indicators (rule of law, voice and accountability, regulatory quality) are inconclusive. Their results suggest that while the rule of law positively affects efficiency in the agricultural sector, voice and accountability and regulatory quality are impacted negatively by rule of law. At the same time, Bhat et al. (2024) provide evidence that institutional indicators (control of corruption, government effectiveness, and regulatory quality) contribute significantly to SDG achievement, with notable moderation effects of governance effectiveness on the foreign direct investment - SDG nexus.

1.3. Role of SDG-related financial support for SDG achievement

Financial support from international organisations like the World Bank, FAO, country-level banks (Multilateral Development Banks) and business sector entities are essential for the implementation of the UN 2030 Agenda (OECD, 2025a). Financial capital is one of the six SDGs associated with basic capital under an integrated reporting framework (Adams, 2017). The SDGs themselves bring new capital allocation decision-making systems into the financial sector and create valuable investment opportunities (Trabacchi & Buchner, 2019). SDG-related procedures also update ESG ratings infrastructure important both to financial sector entities, businesses and regulators (Leleux & van der Kaaij, 2019). Blended, catalytical, green, transition and other concepts of sustainable finance together with green, sustainability, sustainability-linked bonds, and other SDGs-related finance innovations are supporting SDGs progress (OECD, 2025b). Green finance, as a catalyst for the sustainability transition, should be viewed as a strategic tool, not just a niche investment area (Mahajan et al., 2024). However, the

influence of green finance on sustainable development as well as evidence of how it can be conducive to the achievement of the 2030 Agenda are issues that deserve further investigation (Wang et al., 2022). Evidence on financial sector entities' impact on SDGs and sustainability disclosure are given in García-Sánchez et al. (2020), who show that ownership by foreign investors, pension funds, and "other" investors boost the relevance of the SDGs disclosure, while government, financial institutions, and cross-holdings have no impact on such disclosure.

1.4. Business- and country-level assessment focus of SDG progress

Business sector assessments of SDG progress tend to focus on the level of transparency and country-level SDG progress (Pizzi et al., 2020; Kaufmann et al., 2010; Hoang et al., 2023). Indeed, previous work has identified the business sector as one of the critical success factors for SDG achievement (Sachs, 2012). This is consistent with recent evidence on the positive link between ESG disclosure, firm internationalization and financial performance in Asia-Pacific (Hussain et al., 2024).

Country-level assessments of SDG progress are available at several scales. The potential contribution of ESG or sustainability policies towards countries' competitiveness and SDGs progress are studied by Kumar Soni (2023) in the context of emerging economies, and by Radu et al. (2023) in the context of Romania. In Plastun et al. (2020), evidence is provided for the impact of government corporate ESG disclosure and non-government corporate ESG disclosure on SDG ranking for the 50 largest economies, distinguishing developed and developing countries. A more complex approach for ESG policy typology (Pension Fund Regulation, Stewardship Code, Government Corporate ESG disclosure, and Non-Government Corporate ESG disclosure) following the UN Principles of Responsible Investment approach was employed by Plastun et al. (2019). Makarenko et al. (2023) suggest that ESG disclosure regulation increases countries' competitiveness, also with a distinction between developed and developing countries. Their work focuses on strategic dependencies between sustainability disclosure, SDG achievement, and the financial and information efficiency of the financial market (Makarenko et al., 2023).

1.5. Conjectures and implications for empirical work

When we consider the above evidence on what is impacting SDG progress at different scales (sections 1.1., 1.2., 1.3., 1.4.) in the context of our three research questions, a clear overall conjecture arises. We conjecture that more developed (high-income) countries with higher governance quality and higher levels of business sector transparency have more comprehensive sustainability policies and a more substantial impact on SDG progress than developing (low-income) countries.

However, to investigate this broad conjecture through our three research questions, and to contribute to existing works, we aim to account for some of the limitations of previous works. First, they are limited in terms of scope of countries investigated – focusing for example only on the 50 largest economies (e.g. Plastun et al., 2019; Plastun et al. 2020). This encourages us to utilize the data for all available 167 UN Member countries from the SDG report (Sachs et al, 2024). Second, overall SDG scores were primarily used in previous works above. Therefore, to address our research questions, the current study attempts to include not only the country-by-country SDG progress index but also relevant SDG scores for SDGs, specific to agri-food and financial sectors. This helps accounting for relevant SDGs from the SciVal research areas and recent policies database updates.

2. Methodological approach

2.1. Data and variables

To assess the role of sector-specific SDG policies for SDG progress as a dependent variable, we use the UN official data regarding the overall SDG score for the country level and sector-specific SDG score (RQ 1.1 and 1.2). Data available from 2010 up to 2023 are used as in previous studies (Sachs et al., 2024). To address RQ2 and 3, we select the World Bank Atlas classification for grouping countries by the level of income, which is in line with previous work (Glass & Newig, 2019; Makarenko et al., 2023; Movilla-Pateiro et al., 2021). Moreover, this method is more complex for countries' SDG comparisons since it includes both developed countries preferably explored in terms of clusters as employed by Pizzi et al. (2020), and developing countries (Low et al., 2023; Sethi et al., 2024). To assess the role of sector-specific SDG policies for value added in the agri-food sector as a percentage of GDP (RQ 1.3), we used the World Bank data for agriculture, forestry, and fishing value added as % of the country's GDP (World Bank, 2024 a).

As independent variables for RQ 1.1, 1.2 and 1.3 (ESG) policies relevant to agri-food and financial sectors in every available country from the Carrot & Sticks database (C&S, 2025).

As mediating variables, we use one of the Worldwide Governance Indicators (WGI), which describes regulatory quality across countries (World Bank, 2024 b), and the United Nations Global Compact (UNGC) signatories number in every available country, which it taken as a proxy for transparency across countries. It gives the exact number of entities in both sectors, agriculture and banking, voluntarily committed to disclose their efforts in promoting SDG progress (UNGC, 2025).

The Global Industry Classification Standard (GICS) scheme within policies' alignment with the 17 SDGs was used to collect data about the number of sustainability policies (both disclosure and overall sustainability type, voluntary and mandatory) for the two sectors. This is derived from carefully selecting the most relevant SDGs for each sector, as described in the literature section above. In the case of agriculture, we collected data for all available countries from the Agriculture, Forestry, Fishing & Hunting (AFFH) sector; in the case of the financial sector – from Finance and Insurance (FI, including banks and other capital market intermediaries) – only data with sector-specific SDGs alignment is used.

The same scope of businesses belonging to the Food (including fishing and hunting) and forest sectors related to the Financial service, Bank and Insurance sectors were used from the UNGC website. Data for SDG progress was taken from the 2024/25 UN SDG report. The time span 2003-2023 was used to address RQ2, and the 2010-2022 period was used to address RQ3.

To investigate the potential role of governance quality for overall and sector-specific SDGs score progress (RQ2), we used three WGI's (Government Effectiveness, Regulatory Quality and Rule of Law; World Bank, 2024b) as independent variables, and both types of SDGs score as dependent variables, in line with previous works (Sachs et al., 2024).

In the case of RQ3, we use the same dependent variables as for RQ2. Like the other two RQs we used the same independent variables, except for a proxy for financial support where we use government expenditure and bank credit to the agri-food sector from the FAO database (UN FAO, 2025). *Table 2* describes the data in more detail.

Table 2. Characteristics of the data set

Direction	Indicators	Symbol	Time period	Number of countries*
SDG progress	Overall SDG score	sdg_sc	2003-2023	167
	SDG 1 score	sdg1sc		154
	SDG 2 score	sdg2sc		167
	SDG 6 score	sdg6sc		167
	SDG 7 score	sdg7sc		167
	SDG 8 score	sdg8sc		167
	SDG 11 score	sdg11sc		167
	SDG 12 score	sdg12sc		167
	SDG 13 score	sdg13sc		167
	SDG 14 score	sdg14sc		127
	SDG 15 score	sdg15sc		167
Governance quality	Governance Effectiveness Index	gov_eff	2003-2023	167
	Regulatory Quality Index	reg_q		167
	Rule of Law index	rule_law		167
Transparency	UNGC AFFH	ungc_a	2023	165
	UNGC FI	ungc_b	2023	165
Sustainability (SDG) policies	SDG 1 policy AFFH	sdg1p	2023	165
	SDG 2 policy AFFH	sdg2p		165
	SDG 6 policy AFFH	sdg6p		165
	SDG 7 policy AFFH/FI	sdg7p		165
	SDG 8 policy FI	sdg8p		165
	SDG 11 policy FI	sdg11p		165
	SDG 12 policy AFFH/FI	sdg12p		165
	SDG 13 policy FI	sdg13p		165
	SDG 14 policy AFFH	sdg14p		165
	SDG 15 policy AFFH	sdg15p		165
Agriculture, forestry, and fishing value added, % of GDP		e_agr_valadd	2023	165
Funding sources	Credit to Agriculture, Forestry, Fishing	cred_agr	2010-2022	97
	Government Expenditure	gov_exp	2010-2022	91

* The difference in country number depends on the data availability for all indicators included in the model and model modifications

2.2. Models and analysis

Table 3, below, provides an overview of the study design. To address RQ1, PLS-SEM (Partial Least Squares Structural Equation Modeling) was used, which involves assessing the relationships between explicit and latent variables (Hair et al., 2021, Hair & Alamer, 2022). Path diagrams were used to depict such relationships schematically. Standardized coefficients were used to analyze the modeling results, which allow for a more simplified interpretation of the data, particularly correlation coefficients. The following statistical indicators were used: RMSEA (Root Mean Square Error of Approximation) to estimate the population error, AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion) to compare models, CFI (Comparative Fit Index) and TLI (Tucker-Lewis Index) to assess the adequacy of the

model, SRMR (Standardized Root Mean Square Residual) to assess the size of the residuals, and CD (Coefficient of Determination) to determine the explanatory power of the model.

To address RQ2 and 3, panel regression analysis was implemented with fixed and random effects, allowing us to consider both temporal and spatial heterogeneity of the data.

Table 3. Summary of the research questions, variables and methods used

Parameters	RQ				
	1.1	1.2	1.3	2	3
Independent variables	Number of sustainability policies across countries			Governance quality: Government effectiveness, Regulatory Quality Rule of Law	Funding: Government expenditures, Credit to agriculture
Dependent variables	SDG overall score	Sector-specific SDGs scores	Value added of agriculture, forestry, and fishing, % of GDP	SDG overall score Sector-specific SDGs scores	SDG overall score Sector-specific SDGs scores
Mediating variables	UNGC signatories Regulatory Quality			-	-
Methodology	PLS-SEM (path diagrams and standardized coefficients)			Panel regression with fixed and random effects Parametric ANOVA test Nonparametric Kruskal-Wallis test Tukey post hoc test	

All calculations were performed using Stata/SE 18.5 software. Parse Hub software was used for web scraping of the sustainability policy numbers from the Carrots&Sticks database. The 2024 Carrots&Sticks database includes 2,677 distinct ESG and sustainability policies (Chalmers et al. 2024).

3. Conducting research and results

To address RQ 1.1, modification 1 of PLS-SEM was constructed, which involves studying the relationship between sector-specific SDG policies and the country's overall SDG progress score in the agri-food (*Fig. 1*) and the financial sector (*Fig. 2*).

For this purpose, a latent variable SDG policy was formed as a cumulative associational construction on the basis of observed variables sdg1p, sdg2p, sdg6p, sdg7p, sdg12p, sdg14p and sdg15p for agri-food and sdg7p, sdg8p, sdg11p, sdg12p and sdg13p for financial sector. As mediators, variables g_regqual and ungc_a /ungc_b were added to the model., descriptive statistics were used for the data analysis, correlation analysis, and multi-correlation. The multiple linear regression model was applied after (the method of least square), as well as hierarchical multiple regression model.

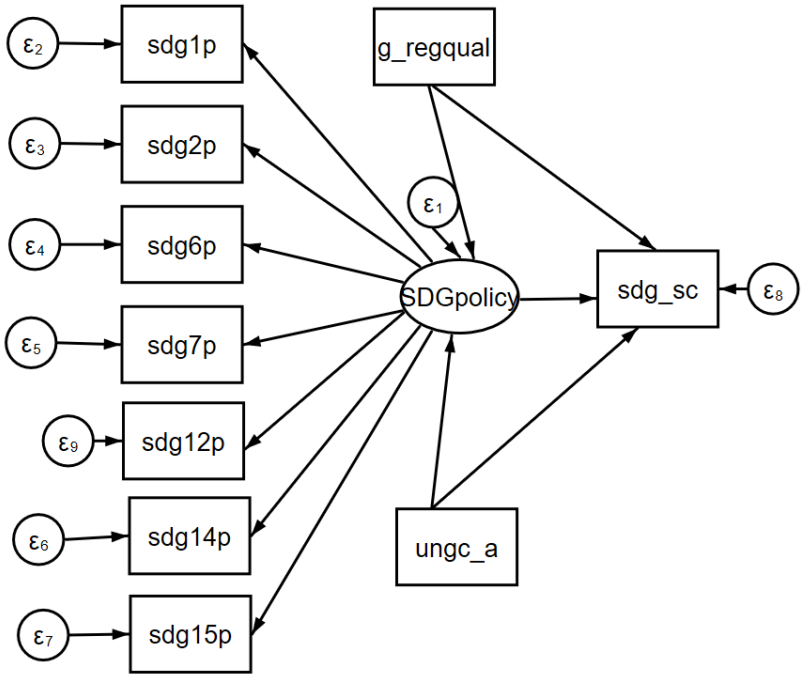

Figure 1. Path diagram of PLS-SEM modification 1 on the cumulative association of sector-specific SDG policies with the country's overall SDGs progress score in the agri-food sector
Source: *own development*

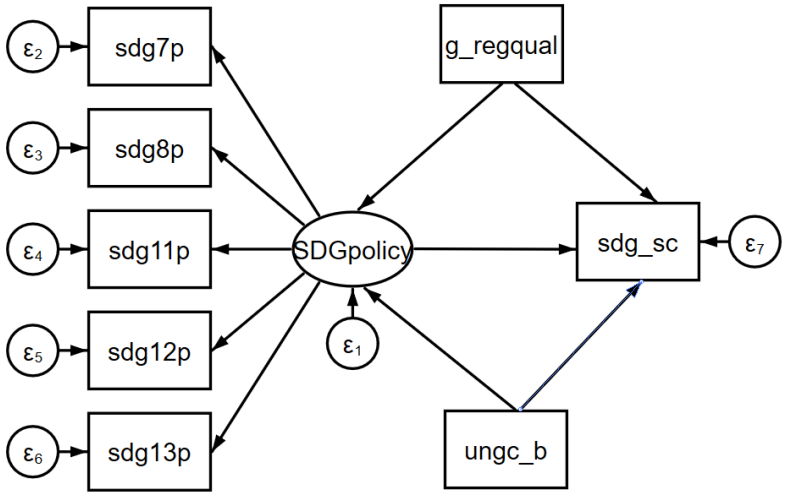

Figure 2. Path diagram of PLS-SEM modification 1 on the cumulative association of sector-specific SDG policies with the country's overall SDGs progress score in the financial sector
Source: *own development*

The modeling results are summarized in *Table 4*, below. They suggest that for both sectors, there is no statistically significant cumulative association of sector-specific SDG policies (as a latent construct in the model) with the country's overall SDG progress score. However, the mediator variable ungc_a as a measure of sustainability transparency has a weak and positive statistically significant relationship with SDG progress score (correlation coefficient 0.10 for agri-food and financial sector) and sector-specific SDG policies (correlation coefficient 0.17 for agri-food and 0.35 for financial). Additionally, the regulatory quality of the

country (as g_regqual) has a significant relationship with SDG progress score (correlation coefficient 0.68 for agri-food and 0.69 for financial sector) and a low but statistically significant relationship with SDG policy (correlation coefficient 0.15 and 0.18, respectively).

Table 4. Results of PLS-SEM modification 1 for the cumulative association of sector-specific SDG policies with the country overall SDGs progress score in agri-food and financial sectors

	Variable	AFFH			Variable	FI		
	Standardized	Coef.	OIM std.err.	P>|z|	Standardized	Coef.	OIM std.err.	P>|z|
Structural	sdg_sc				sdg_sc			
	SDGpolicy	0.02	0.06	0.74	SDGpolicy	0.03	0.06	0.67
	ungc_a	0.10	0.06	0.08*	ungc_b	0.10	0.06	0.10*
	g_regqual	0.68	0.04	0.00***	g_regqual	0.69	0.04	0.00***
	_cons	6.88	0.34	0.00***	_cons	6.87	0.33	0.00***
	SDGpolicy				SDGpolicy			
	ungc_a	0.18	0.08	0.02**	ungc_b	0.35	0.07	0.00***
	g_regqual	0.16	0.08	0.04**	g_regqual	0.18	0.07	0.02**
Measurement	sdg1p1				sdg7p			
	SDGpolicy	0.82	0.03	0.00***	SDGpolicy	0.92	0.01	0.00***
	_cons	0.50	0.09	0.00***	_cons	0.44	0.10	0.00***
	sdg2p1				sdg8p			
	SDGpolicy	0.92	0.01	0.00***	SDGpolicy	0.91	0.02	0.00***
	_cons	0.60	0.10	0.00***	_cons	0.54	0.10	0.00***
	sdg6p1				sdg11p			
	SDGpolicy	0.97	0.01	0.00***	SDGpolicy	0.90	0.02	0.00***
	_cons	0.55	0.10	0.00***	_cons	0.44	0.10	0.00***
	sdg7p1				sdg12p			
	SDGpolicy	0.88	0.02	0.00***	SDGpolicy	0.91	0.02	0.00***
	_cons	0.62	0.10	0.00***	_cons	0.55	0.10	0.00***
	sdg12p1				sdg13p			
	SDGpolicy	0.89	0.02	0.00***	SDGpolicy	0.95	0.01	0.00***
	_cons	0.62	0.10	0.00***	_cons	0.43	0.10	0.00***
	sdg14p1							
	SDGpolicy	0.92	0.01	0.00***				
	_cons	0.53	0.10	0.00***				
	sdg15p1							
	SDGpolicy	0.95	0.01	0.00***				
	_cons	0.56	0.10	0.00***				

**** p<0.01, ** p<0.05, * p<0.1, N = 167 countries*
Source: *own calculations*

To address RQ 1.2 and assess the cumulative association of sector-specific SDG policies with relevant SDG progress scores, the second modification of the model was constructed. It consists of two latent constructs, the first of which is similar to the previous modification (SDG policy), and the second, SDGprogr, was formed by the most significant SDGs for the agri-food (*Fig. 3*) and financial sector (*Appendix A, Figure A.1*).

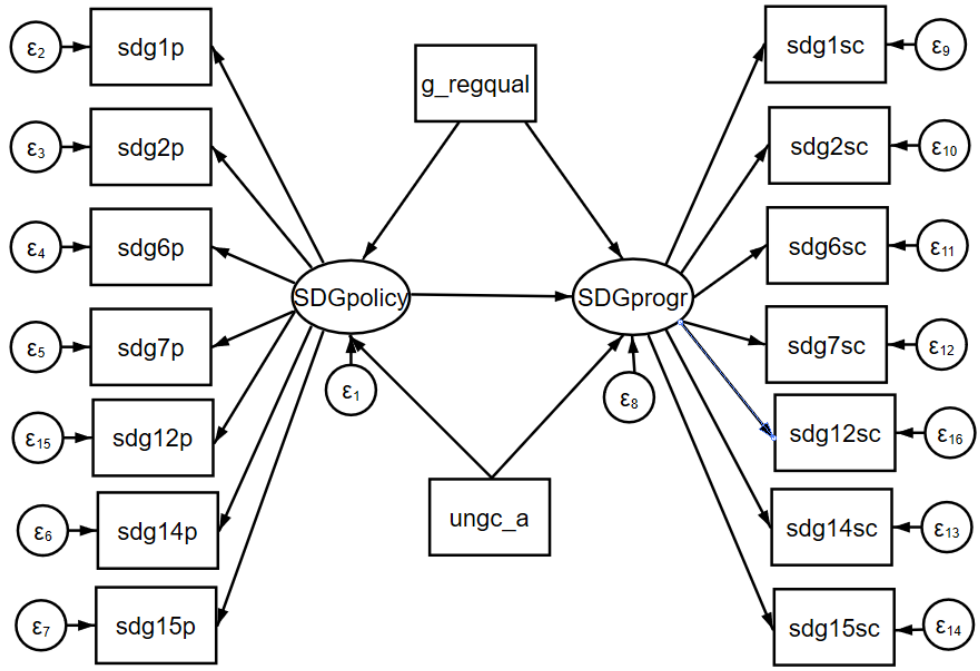

Figure 3. Path diagram PLS-SEM modification 2 on the cumulative association of sector-specific SDG policies with the relevant SDGs progress score for the agri-food sector
Source: *own development*

The modelling results (*Table 5*) suggest that there is a statistically significant but low cumulative association of sector-specific SDG policies with the relevant SDG progress score in the agri-food sector (correlation coefficient 0.12 for * p<0.1). As in the previous modification, regulatory quality has a significant relationship with SDG progress (0.65 for agri-food and 0.85 for financial sector), and ungc_a and ungc_b have low values of correlation coefficients.

Table 5. Results of PLS-SEM modification 2 for the cumulative association of sector-specific SDG policies with the relevant SDGs progress score in agri-food and financial sectors

	Variable		AFFH		Variable		FI	
	Standardized	Coef.	OIM std.err.	P>|z|	Standardized	Coef.	OIM std.err.	P>|z|
Structural	SDGprogr				SDGprogr			
	SDGpolicy	0.12	0.06	0.06*	SDGpolicy	0.00	0.05	0.95
	g_regqual	0.65	0.05	0.00***	g_regqual	0.85	0.03	0.00***
	ungc_a	0.10	0.06	0.09*	ungc_b	0.04	0.05	0.04*
	SDGpolicy				SDGpolicy			
	g_regqual	0.16	0.08	0.04**	g_regqual	0.18	0.07	0.02**
	ungc_a	0.18	0.08	0.02**	ungc_b	0.35	0.07	0.00***
Measurement	sdg1sc				sdg7sc			
	SDGprogr	0.65	0.05	0.00***	SDGprogr	0.69	0.04	0.00***
	_cons	1.94	0.13	0.00***	_cons	3.00	0.17	0.00***
	sdg2sc				sdg8sc			
	SDGprogr	0.61	0.05	0.00***	SDGprogr	0.52	0.06	0.00***
	_cons	5.64	0.32	0.00***	_cons	7.80	0.43	0.00***
	sdg6sc				sdg11sc			
	SDGprogr	0.93	0.02	0.00***	SDGprogr	0.74	0.04	0.00***

_cons	4.87	0.26	0.00***	_cons	3.86	0.20	0.00***
sdg7sc				sdg12sc			
SDGprogr	0.80	0.03	0.00***	SDGprogr	-0.95	0.02	0.00***
_cons	2.95	0.17	0.00***	_cons	4.44	0.19	0.00***
sdg12sc				sdg13sc			
SDGprogr	-0.22	0.08	0.00***	SDGprogr	-0.73	0.04	0.00***
_cons	5.64	0.32	0.00***	_cons	4.42	0.23	0.00***
sdg14sc							
SDGprogr	0.18	0.08	0.00***				
_cons	1.66	0.12	0.00***				
sdg15sc							
SDGprogr	0.11	0.08	0.00***				
_cons	4.66	0.27	0.00***				

**** p<0.01, ** p<0.05, * p<0.1, N = 167 countries*
Source: *own calculations*

To address RQ 1.3 with the third modification of the model, we investigate the relationship between sector-specific SDG policies and agri-food value added as percentage of GDP (e_agr_valadd). The path diagram for the agri-food sector is shown in *Figure 4*; for the financial sector see *Appendix A, Figure A.2.*

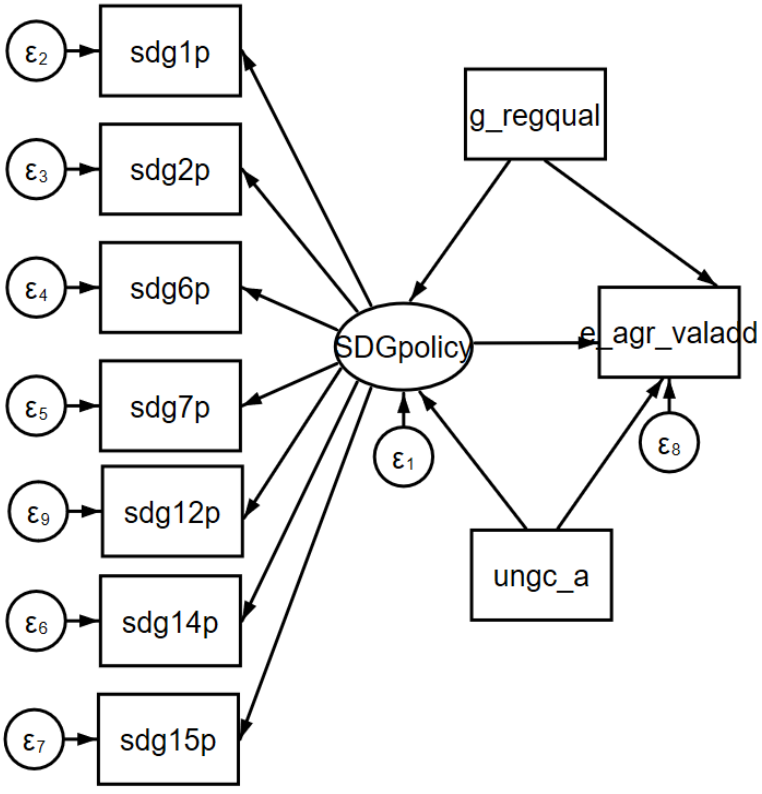

Figure 4. Path diagram of PLS-SEM modification 3 on the cumulative association of sector-specific SDG policies with the agri-food value added (percentage of GDP) for the agri-food sector
Source: *own development*

The results (*Table 6*) show that sector-specific SDG policies have no statistically significant relationship with the value added of agriculture, forestry, and fishing. Instead, regulatory quality (g_regqual) has an inverse average correlation (-0.50) with agri-food and -0.51 for the financial sector.

Table 6. Results of PLS-SEM modification 3 for the cumulative association of sector-specific SDG policies with value added (as percentage of GDP) in the agri-food sector

	Variable	AFFH			Variable	FI		
	Standardized	Coef.	OIM std.err.	P>|z|	Standardized	Coef.	OIM std.err.	P>|z|
Structural	e_agr_valadd				e_agr_valadd			
	SDGpolicy	0.02	0.07	0.79	SDGpolicy	0.00	0.07	0.99
	g_regqual	-0.50	0.06	0.00***	g_regqual	-0.51	0.06	0.00***
	ungc_a	-0.08	0.07	0.22	ungc_b	-0.07	0.07	0.32
	_cons	0.99	0.09	0.00***	_cons	0.99	0.10	0.00***
	SDGpolicy				SDGpolicy			
	g_regqual	0.16	0.08	0.04**	g_regqual	0.18	0.07	0.02**
	ungc_a	0.18	0.08	0.02**	ungc_b	0.35	0.07	0.00***

**** p<0.01, ** p<0.05, * p<0.1, N = 165 countries*
Source: *own calculations*

To summarise the research results for RQ1, sector-specific SDG policies have a statistically significant but very low associational relationship with the overall country SDG progress and sector-specific SDG score in agri-food and banking sectors. However, there is no statistically significant relationship between those policies and the value added in the agri-food sector as percentage of GDP (directly with agri-food-specific SDG policies and indirectly – with financial sector policies).

Transparency has a weak but positive statistically significant relationship in both model modifications – for country-overall SDG scores and sector-specific SDG scores. The results obtained are in line with the literature on decoupling and SDG washing (Aboud, 2024), and thus also studies by Silva (2021), Costa et al. (2025) and Ittipornpaisarn et al. (2025), where SDG disclosure is found to be mostly used by businesses as a symbolic legitimization strategy. The results thus also corroborate with those by Emma & Jennifer (2021), where SDG reporting is considered as symbolic value for stakeholders. Our results regarding transparency can also be interpreted in the context of Thammaraksa et al. (2024), who point out that when companies are identifying relevant SDGs based on a standardized SDG progress assessment framework, this can prevent companies from simply "icon-picking" SDGs without addressing the real issues.

Further, we find that regulatory quality has a significantly positive and strong role as a mediating variable on overall country SDG scores and sector-specific SDG progress. Regulatory quality has also a significantly negative and strong role for value added in the agri-food sector. The positive role identified for regulatory quality is in line with findings from Glass & Newig (2019), who linked SDG implementation with enhancing democratic institutions by facilitating decision-making, policy acceptance, and ensuring accountability and transparency.

Finally, a comparison of the quality of the constructed model modifications is given in *Table B.1 (Appendix B*). This table suggests that CFI and TLI are at an acceptable level for all modifications. Based on AIC and BIC, modification 1 for the agri-food and financial sector has the lowest value, but according to the RMSEA indicator, modification 2 has the closest value

to the acceptable one. The highest level of the coefficient of determination has modification 2 for the financial sector, indicating the level of explanatory power of the model.

To address RQ 2 while accounting for the fact that the regulatory environment had the most significant role for SDGs progress, panel regression models were built to assess the role of governance quality for SDGs progress on agri-food and financial sector-specific SDGs, considering the country-level income. To check to what extent governance effectiveness, regulatory quality and rule of law differ depending on the group of countries by income level, we employed ANOVA tests with the Kruskal-Wallis test (*Appendix C Table C.1*) and the Tukey post hoc test (*Table C.2*).

The results in *Table 7* show that for all indicators (gov_eff – sdg_sc) at least one of the group means differs from the rest. For a more detailed comparison of all groups, the Tukey post hoc test was applied pairwise. The results presented in table 8 confirm the conjecture that countries have different means for regulatory environmental indicators to achieve progress on the SDGs as a function of their income levels.

The following *Table 7* presents the results of the regression analysis with fixed effects for panel data.

Table 7. Comparison of panel regression models on the role of governance quality indicators regarding overall SDGs progress for countries (by level of income)

	(1)			(2)			(3)		
	gov_eff	Constant	Rsq	reg_q	Constant	Rsq	rule_law	Constant	Rsq
G	1.572***	64.51***	0.615	1.214***	64.45***	0.548	2.409***	64.71***	0.540
	(0.206)	(0.0451)		(0.216)	(0.0439)		(0.234)	(0.0521)	
HI	-0.577*	73.87***	0.331	-0.685**	73.99***	0.396	-0.331	73.62***	0.368
	(0.331)	(0.333)		(0.349)	(0.354)		(0.379)	(0.365)	
UMI	3.087***	68.40***	0.02	1.793***	68.10***	0.03	4.372***	69.50***	0.03
	(0.340)	(0.109)		(0.378)	(0.116)		(0.435)	(0.195)	
LMI	3.300***	60.35***	0.367	2.278***	59.69***	0.167	4.576***	61.34***	0.188
	(0.535)	(0.363)		(0.512)	(0.352)		(0.592)	(0.418)	
LI	0.0256	48.90***	0.382	1.740***	50.59***	0.289	1.566***	50.49***	0.401
	(0.495)	(0.579)		(0.574)	(0.577)		(0.502)	(0.533)	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: *own calculations*

Considering the entire sample of 167 countries (row labelled G), all three regulatory environmental indicators have a statistically significant relationship with the country's overall SDG progress score. In particular, an improvement in the regulatory environment index by at least one unit is associated with a corresponding increase in SDG progress by 1.6 units due to governance effectiveness, or 1.2 units due to regulatory quality, or 2.4 units due to rule of law. At the same time, these three models have an average level of determination coefficients, i.e. approximately 54-61% of the variation in the dependent variable is due to the identified factors.

Furthermore, the results vary by the income level of countries. For upper middle-income countries, no statistically significant patterns were found for any indicator of governance quality. For high-income countries, governance effectiveness and regulatory quality have an inverse relationship; with the rule of law, no statistically significant relationship was confirmed. For lower middle income countries, governance effectiveness has a lower yet significant role, the remaining indicators also have a positive role, but the explanatory power of the model is lower (the coefficient of determination is 0.16-0.18). For low-income countries, the rule of law

plays a significant role, since regulatory quality is next in the coefficient of determination, and no statistically significant relationship was found for governance effectiveness.

Table 8 presents the results of the regression analysis for the most significant SDGs in the agri-food and financial sectors. In particular, it was found that governance quality does not significantly relate to progress towards SDGs 14 and 15. For the agri-food sector, the negative role of the regulatory environment for SDG 12 achievement is most significant in terms of the coefficient of determination, which varies between 69-79%. In particular, with an increase in the management efficiency indicator by one unit, progress towards SDG 12 decreases by 1.6 units. For the remaining indicators, a direct relationship is observed, while the explanatory power of the models is 30-40%.

For the financial sector, improving governance quality is also associated with a decrease in SDG 13. For dependencies with SDGs 7, 8, 11, a moderate direct relationship is observed.

Table 8. Comparison of panel regression models on the role of governance quality for sector-specific SDGs progress in the agri-food and financial sectors (by level of income at country level)

Variable	(1)			(2)			(3)		
	gov_eff	Constant	Rsq	reg_q	Constant	Rsq	rule_law	Constant	Rsq
AFFH									
sdg1sc	9.45***	71.47***	0.470	7.670***	70.99***	0.415	9.554***	72.02***	0.372
	(0.692)	(0.164)		(0.725)	(0.156)		(0.805)	(0.200)	
sdg2sc	2.421***	57.727***	0.381	1.747***	57.636***	0.332	2.983***	57.943***	0.337
	(0.230)	(0.050)		(0.243)	(0.049)		(0.263)	(0.059)	
sdg6sc	0.497**1	64.369***	0.497	-0.466*	64.36***	0.485	1.080***1	64.48***	0.430
	(0.237)	(0.847)		(0.252)	(0.051)		(0.268)	(0.896)	
sdg7sc	1.511***	58.52***	0.448	1.051***	58.46***	0.383	3.760***	58.91***	0.361
	(0.353)	(0.077)		(0.369)	(0.075)		(0.400)	(0.089)	
sdg12sc	-1.599***	77.07***	0.739	-1.441***	77.12***	0.693	-2.097***	76.91***	0.718
	(0.163)	(0.036)		(0.171)	(0.035)		(0.186)	(0.041)	
sdg14sc	-1.190***	63.64***	0.007	-1.158***	63.66***	0.003	-0.576	63.56***	0.001
	(0.367)	(0.079)		(0.385)	(0.081)		(0.421)	(0.079)	
sdg15sc	-0.111	63.16***	0.001	1.049***	63.21***	0.001	0.752**	63.26***	0.001
	(0.323)	(0.071)		(0.337)	(0.069)		(0.370)	(0.082)	
FI									
sdg7sc	1.511***	58.52***	0.448	1.051***	58.46***	0.383	3.760***	58.91***	0.361
	(0.353)	(0.077)		(0.369)	(0.075)		(0.400)	(0.089)	
sdg8sc	1.328***	68.87***	0.387	1.172***	68.83***	0.346	1.393***	68.94***	0.343
	(0.173)	(0.038)		(0.181)	(0.037)		(0.199)	(0.044)	
sdg11sc	0.604***1	72.67***	0.575	0.556**1	72.66***	0.515	0.827***1	72.74***	0.523
sdg12sc	-1.599***	77.07***	0.739	-1.441***	77.12***	0.693	-2.097***	76.91***	0.718
	(0.163)	(0.036)		(0.171)	(0.035)		(0.186)	(0.041)	
sdg13sc	-2.325***	82.51***	0.421	-1.641***	82.60***	0.373	-2.382***	82.37***	0.386

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
1 – Random-effects regression
Source: *own calculations*

To summarise the research results for RQ2, all three indicators used as proxies for countries' governance quality have a statistically significant relationship with SDG progress. However, those proxies differ depending on the group of countries by income level as supported by ANOVA, Kruskal-Wallis and the Tukey post hoc tests. A similar result regarding significance of the rule of law and inverse relationship with regulatory quality has been found

by Trakem & Fan (2024) in the context of agriculture. Moreover, our results suggest that high-income countries rely more on governance effectiveness and regulatory quality for achieving SDG progress, compared to relying on the rule of law, which characterises low-income countries' way to achieving SDG progress. Regarding a sector-specific SDG breakdown, governance quality indicators are positively associated with all SDGs except for SDG 12 (both sectors) and for SDG 13 (the financial sector).

To address RQ 3, the study of the impact of financial support on SDG progress was carried out following a similar process as for RQ2. First, averages for countries with different income levels were compared, which confirmed the existence of at least one distinct group using ANOVA tests with Kruskal-Wallis (*Appendix D, Table D.1*). However, the results of the Tukey post hoc test (*Appendix D, Table D.2*) suggest that no difference in the means exists for both government expenditure and bank credit (agri-food sector) for countries with upper middle income vs. lower middle income.

The regression analysis results with fixed effects are presented in *Table 9* and indicate a low quality of the models with low coefficients of determination. In particular, among all countries in the sample, it is observed that a one percent change in bank credit to the agri-food sector is associated with only a 0.02% increase in SDGs. A significant positive relationship is also found in countries with lower middle income.

Table 9. Comparison of panel regression models on the role of indicators of financial sources (government expenditure vs bank credit) for SDG progress

Country	(1)			(2)		
group	cred_agr	Constant	Rsq	gov_exp	Constant	Rsq
G	0.023***	4.040***	0.130	0.007***	4.151***	0.009
	(0.002)	(0.011)		(0.002)	(0.012)	
HI	0.015***	4.186***	0.050	0.003	4.283***	0.004
	(0.003)	(0.027)		(0.003)	(0.018)	
UMI	0.007**	4.196***	0.013	0.004	4.220***	0.003
	(0.004)	(0.022)		(0.003)	(0.020)	
LMI	0.037***	3.882***	0.344	0.041***	3.890***	0.157
	(0.003)	(0.018)		(0.006)	(0.031)	
LI	0.018***	3.867***	0.089	-0.012*	3.996***	0.026
	(0.005)	(0.022)		(0.007)	(0.029)	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: *own calculations*

Next, we incorporate time effects by adding the dummy variables for a year, which improves model quality significantly (*Table 10*). As a result, there is an increase in the explanatory power of the model to 66% for bank credit (model 1) and by 64% for government expenditure (model 2). These models suggest that lending to the agricultural sector and government expenditure is associated with a relatively small but insignificant progress in the SDGs, yet over the years, this impact gradually increases. This suggests that strengthening global lending initiatives for sustainability may have an increasingly positive role to play for SDG progress in the agricultural sector. This result could be viewed in the context of FAO evidence, which shows that the largest volume of credit to agriculture was granted in 2022 to developing countries (China, Upper-middle income country, and India, Lower-middle income country) (UN FAO (2023). In terms of policy implications, our results thus suggest that a re-

orientation of international financial flows is required to enable developing countries to attain SDGs more effectively in the domains of climate change, energy, and food (Tondel et al., 2022).

Table 10. Comparison of panel regression models with time effects on the role of financial sources (government expenditure vs bank credit) for SDG progress

Variable	(1)	(2)
cred_agr	0.010***	
	(0.001)	
gov_exp		0.007***
		(0.001)
2011.year	0.004*	0.005**
	(0.002)	(0.003)
2012.year	0.011***	0.013***
	(0.002)	(0.003)
2013.year	0.013***	0.016***
	(0.002)	(0.003)
2014.year	0.023***	0.026***
	(0.002)	(0.003)
2015.year	0.028***	0.031***
	(0.002)	(0.003)
2016.year	0.033***	0.037***
	(0.002)	(0.003)
2017.year	0.40***	0.044***
	(0.002)	(0.003)
2018.year	0.044***	0.048***
	(0.002)	(0.003)
2019.year	0.050***	0.054***
	(0.002)	(0.003)
2020.year	0.055***	0.060***
	(0.002)	(0.003)
2021.year	0.057***	0.062***
	(0.002)	(0.003)
2022.year	0.059***	0.065***
	(0.002)	(0.003)
Constant	4.091***	4.114***
	(0.007)	(0.008)
R-squared	0.666	0.649

Source: *own calculations*

We also considered individual SDGs as the dependent variable, to find that both bank credit and government expenditures have a rather insignificant role, with no significance at all for bank credit regarding SDGs 11, 14, 15, and similarly no significance for government expenditure regarding SDGs 7, 8, 12 (table not reported here).

To summarise the research results for RQ3, an increase in bank credit to the agri-food sector boosts SDG progress slightly, especially in lower-middle-income countries, but the models have low explanatory power. However, incorporating time effects significantly improves model quality, increasing explanatory power to 66% for bank credit and 64% for government expenditure, showing a small but growing impact on SDG progress over time.

When considering individual SDGs, both bank credit and government expenditures have an insignificant impact.

Conclusion

Considering increasing public scrutiny regarding SDG achievements, more evidence is needed for judging allocative efficiency of financial and other resources to achieving the UN sustainability goals and thereby contributing to a de-politization of the public SDG discourse. This paper focuses on sector-level SDG contributions of agri-food and finance sectors because of their mutual interdependencies, also for achieving the SDGs. We explore the country-level role of several key factors for achieving SDG progress in the agri-food and financial sectors, namely sector-specific sustainability policies, governance quality, and financial support from international lenders. More specifically, the paper addressed three questions: what is the role of sector-specific SDG policies for progress in SDGs and in particular value added as a percentage of GDP, what is the role of governance quality for SDG progress, and what is the role of country-level financial support from government and banks on SDG progress? To answer these three research questions, we apply PLS-SEM (path diagrams and standardized coefficients) and panel regression with fixed and random effects.

We find a statistically significant yet small association of sector-specific policies with overall SDG progress and sector-specific SDG scores, yet no significant relationship with value added in the agri-food sector. The research underscores the importance of transparency and regulatory quality, supporting their positive role for SDG progress, while also suggesting a potentially negative role of regulatory quality for value added in the agri-food sector. Additionally, the study provides insights into how governance quality indicators affect SDG progress differently across country income levels, a distinction which is important in the global sustainability and development debate (OECD, 2025a, 2025b; World Bank, 2024b). We find that high-income countries benefit more from governance effectiveness and regulatory quality, whereas low-income countries more from the rule of law. The findings also emphasize the varying role of governance quality for different SDGs, and the slight but growing role of bank credit and government expenditure for SDG progress over time.

However, study limitations need to be acknowledged. The findings indicate that sector-specific SDG policies have a statistically significant but minimal impact on overall SDG progress and sector-specific scores, suggesting that other factors may play a more substantial role. Some models have low explanatory power, limiting the robustness and generalizability of the results. Further work is therefore needed, also beyond banking and agricultural sectors, to assess the robustness of our key finding that governance quality matters substantively and needs therefore greater attention by policymakers and global businesses alike.

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Appendixes

Appendix A

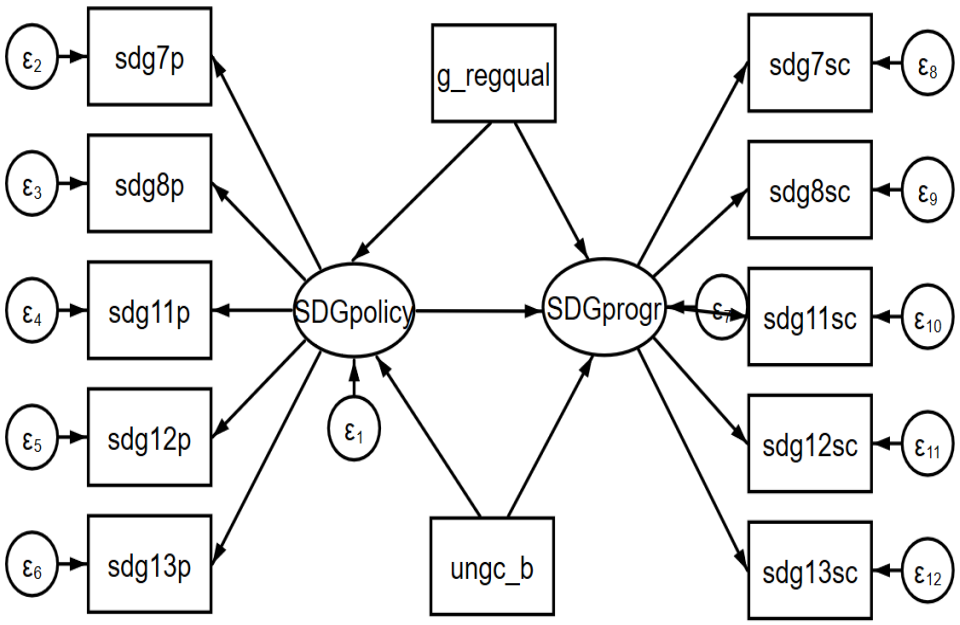

Figure A.1. Path diagram PLS-SEM modification 2 on cumulative impact of sector-specific SDG policies and the relevant SDGs progress score for financial sector

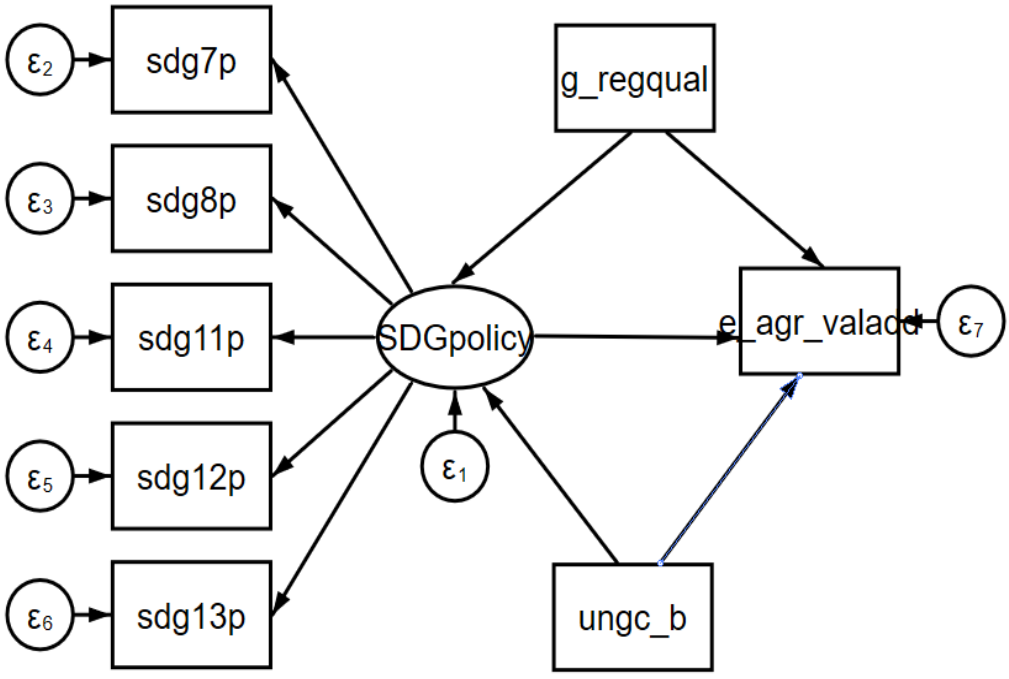

Figure A.2. Path diagram of PLS-SEM modification 3 on cumulative impact of sector-specific SDG policies and the agri-food value added for financial sector

Appendix B

Table B.1 Results comparisons of the quality of model modifications (agri-food and financial sectors)

Fit statistic	Sector	Value		
		Modification 1	Modification 2	Modification 3
Population error RMSEA	AFFH	0.127	0.089	0.129
	FI	0.106	0.103	0.108
AIC	AFFH	6179.478	13334.558	6238.945
	FI	6345.274	11676.189	6414.972
BIC	AFFH	6257.127	13461.902	6316.594
	FI	6413.604	11784.898	6483.303
CFI	AFFH	0.956	0.946	0.953
	FI	0.943	0.915	0.938
TLI	AFFH	0.936	0.933	0.932
	FI	0.910	0.890	0.902
Size of residuals: SRMR	AFFH	0.029	0.050	0.029
	FI	0.024	0.055	0.026
CD	AFFH	0.515	0.495	0.309
	FI	0.599	0.783	0.406

Source: *own calculations*

Appendix C

Table C.1. Testing the differences in means between governance quality and SDGs progress for countries by the level of income (ANOVA & Kruskal-Wallis tests)

Variable	ANOVA						Kruskal-Wallis test	
	Source	SS	df	MS	F	Prob >F	chi2	Prob
gov_eff	Between groups	2230.394	4	557.	1609.68	0.000	2247.827	0.000
	Within groups	1209.638	3492	0.346				
reg_q	Between groups	2125.647	4	531.41	1570.22	0.000	2211.416	0.000
	Within groups	1181.801	3492	0.34				
rule_law	Between groups	2172.52	4	543.13	1471.77	0.000	2057.068	0.000
	Within groups	1289.401	3494	0.37				
sdg_sc	Between groups	260344.4	4	65086.09	1532.35	0.000	2168.760	0.000
	Within groups	148746.8	3502	42.47				

Source: *own calculations*

Table C.2. Testing the pairwise differences in means between governance quality and SDGs progress for countries by the level of income (Tukey post hoc test)

Pairwise comparisons	*gov_eff*		*reg_q*		*rule_law*		*sdg_sc*	
	t	P>|t|	t	P>|t|	t	P>|t|	t	P>|t|
LI vs HI	-67.35	0.000	-63.02	0.000	-60.26	0.000	-70.58	0.000
LMI vs HI	-63.57	0.000	-64.93	0.000	-61.39	0.000	-52.17	0.000
UMI vs HI	-46.47	0.000	-46.99	0.000	-50.28	0.000	-19.45	0.000
LMI vs LI	14.55	0.000	9.3	0.000	9.44	0.000	26.46	0.000
UMI vs LI	28.08	0.000	23.48	0.000	18.25	0.000	52.54	0.000
UMI vs LMI	16.19	0.000	16.98	0.000	10.54	0.000	31.04	0.000

Source: *own calculations*

Appendix D

Table D.1. Testing the differences in means between indicators of government expenditure and bank credit for countries by the level of income: ANOVA and Kruskal-Wallis tests

Variable	ANOVA					Kruskal-Wallis test	
	Source	SS	df	MS	F	Prob >F	chi2	Prob
cred_agr	Between groups	1512.363	3	504.121	110.56	0.000	259.070	0.000
	Within groups	5717.614	1254	4.559				
gov_exp	Between groups	296.775	3	9925	35.06	0.000	107.408	0.000
	Within groups	3292.480	1167	2.821				

Source: *own calculations*

Table D.2. Testing for the differences in means between government expenditure and bank credit for countries by level of income (Tukey post hoc test)

Pairwise comparisons	*cred_agr*		*gov_exp*	
	t	P>|t|	t	P>|t|
LI vs HI	-17.44	0.000	-10.09	0.000
LMI vs HI	-10.49	0.000	-5.31	0.000
UMI vs HI	-10.2	0.000	-4.01	0.000
LMI vs LI	9.23	0.000	5.84	0.000
UMI vs LI	9.22	0.000	6.93	0.000
UMI vs LMI	0.11	1.000	1.34	0.540

Source: *own calculations*