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## The nexus between trade and investment, ESG, and SDG

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DISCUSSION PAPER SERIES NO. 2024-28

# The Nexus between Trade and Investment, ESG, and SDG

*Mark Anthony A. Barral*



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# The Nexus between Trade and Investment, ESG, and SDG

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PHILIPPINE INSTITUTE FOR DEVELOPMENT STUDIES

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## **Abstract**

The integration of the concept of environment, social, and governance (ESG) into trade and investment to contribute to the Sustainable Development Goals (SDGs) is becoming a new consensus. ESG considerations are becoming crucial in national and regional policies for sustainable development strategies and regulatory frameworks, highlighting the role of governments in shaping the landscape by incentivizing companies to adopt sustainable practices, disclosing ESG information, and integrating social and environmental factors into decision-making. This also highlights the role of international investment agreements in coordinating trade, investment, and sustainable development as it forms a legal framework that is conducive for enhancing the transparency and predictability of international investment ecosystem, which reduces uncertainties and prompts long-term and stable investment. While ESG and sustainability change the way businesses, policymakers, and rule-makers make decisions, trade and investment become pivotal conduits for operationalizing SDG-related global priorities.

This paper explores the growing relevance of ESG principles in trade and investment as it gains traction not only in the conduct of businesses but also in national policies, corporate governance, and regulatory frameworks. This paper aims to examine the ESG landscape in the Philippines and in the region, understand its potential to enhance trade and investment towards achieving the Sustainable Development Goals (SDGs), and explore strategies for effective ESG adoption. The results highlight varying response of SDG to trade and investment indicators. With respect to ESG interactions, the results indicate that the influence of trade and investment are improved when integrated with ESG.

**Keywords:** ASEAN, biodiversity trade, carbon emissions, carbon pricing, decarbonization, environmental, social, and governance (ESG), foreign direct investment, green bonds, investment liberalization, renewable energy, sustainable development goals (SDGs)

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# The Nexus between Trade and Investment, ESG, and SDGs

*Mark Anthony A. Barral\**

## 1. Introduction

Trade and investment, in principle, can be the transmission belt through which greater emphasis on achieving global priorities, often captured in Sustainable Development Goals (SDGs). Yet, this should be done in a world where environmental, social, and governance (ESG) and associated climate-related pressures are shaping market dynamics and investor behavior, as well as governance, and other related pressures (ICC 2022 and Zhan and Santos-Paulino 2021).

For a sub-region such as the member countries of the Association of Southeast Asian Nations (ASEAN), the conclusion of an investment agreement is another testament to the nexus between ESG and SDGs and trade and investment, facilitated by international laws. It finalizes basic governance principles in relation to investment protection, market access, non-discriminatory treatment, and a review procedure (ASEAN 2013).

But the question of broader government and public accountability and upholding of domestic policies that are supportive of broader global ESG and SDGs objectives, is more complex and critical. Pressures will arise as the inter-spatial nexus on trade and investment flows through critical SDG areas, whether it is the environment and climate change, are working against fair working conditions and wages, or are part of global corporate liabilities.

Among the proponents and advocates of ESG are NGOs, policymakers, and academic researchers, such as the Principles for Responsible Investment (PRI), a UN-supported initiative, and the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) organizations, which provide frameworks and standards for corporate reporting on ESG performance.<sup>1</sup>

According to Banker (2023), trade rules are increasingly becoming ESG rules, considering that the evolution of supply chains has led to the ways trade is being regulated or facilitated by countries, with environment, social, and governance being integrated into their trade policies.

The paper is motivated by the need to understand the relevance and role of trade and investment as a tool for gaining more traction in ESG, which will then lead to achieving the Sustainable Development Goals. For a country like the Philippines, ESG is a relatively newer concept for many, and has only been practiced by a handful of companies. Understanding the landscape and current situation therefore is important to help facilitate ESG adoption.

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<sup>1</sup> <https://www.unpri.org/about>; <https://www.globalreporting.org/about-gri/what-is-gri/>;  
<https://www.sasb.org/about/>

## 2. Trade and Investment in Southeast Asia

Trade and investment are important steps toward economic development. It has been argued in literature that the focus of global initiatives has generally been directed towards maximizing rising economic gains by economies, enabling them to specialize in the type of exports based on its specific advantageous factor endowments such as land, capital, skill, and unskilled labor to raise productivity, output, exports, and incomes (Krist 2013 and IMF 2008). An ingredient, however, which has been missing in these global endeavors is the way governments cooperate to promote trade and investments that incorporate ESG principles to achieve the various sustainable development goals (SDGs) and other simultaneous economic, social, and environmental objectives. The current international rule-based trading system, with individual countries and regions engaging in preferential agreements, has rules that allow nations to pursue national emphasis on social, environmental, industrial, and investment policies. However, these rules should also contribute to the promotion and harmonization of competition and reduction of distortions in international economic relations (Matsushita 2004).

ASEAN is a restoring voice in the global trade context by actively involving in the World Trade Organization's negotiations on issues of interest and by further promoting ASEAN-led platforms that reflect the region's shared interests in trade and investment. Meanwhile, the RCEP negotiations have concluded, and the agreement has been officially signed by its 15 member countries, promising significant potential implications for involved economies. ASEAN economies are signatories of over 200 investment agreements with both developed and developing economies generally on a bilateral basis. These agreements cover policy space and areas that are of key interest to emerging economies. ASEAN's charter-based regional dispute resolution mechanism, ASEAN Comprehensive Investment Agreement (ACIA), allows investors to address investment issues in the region. Such dispute resolution mechanisms will facilitate rule enforcement (ASEAN 2021 and AIR 2019).

### 2.1 Trade and Investment Situations in Southeast Asia

Figure 1 presents the trends in total trade, exports, and imports for Southeast Asia from 2000 to 2022, showing upward trends. Total trade has grown steadily over the two decades, starting from around one trillion USD in 2000, then surpassing four trillion USD by 2022. This reflects Southeast Asia's increasing integration into the global economy, with growing involvement in international trade. Similarly, both exports and imports have seen steady growth, with imports rising slightly faster in recent years. The rise in exports suggests that Southeast Asia has become a major global supplier of goods, particularly in contributory products, such as electronics, manufacturing, and agriculture. The rise in imports, on the other hand, indicates the region's growing demand, particularly for raw materials, intermediate goods, and consumer products, which may be reflective of the expansion of domestic economies and rise in incomes.

There's a visible dip in trade around 2008-2009, which corresponds to the global financial crisis. This affected Southeast Asia's trade due to declining global demand. Another noticeable drop occurs in 2020, likely due to the COVID-19 pandemic. Lockdowns, supply chain disruptions, and reduced global demand temporarily decreased both exports and imports. However, trade rebounded strongly in 2021 and 2022.

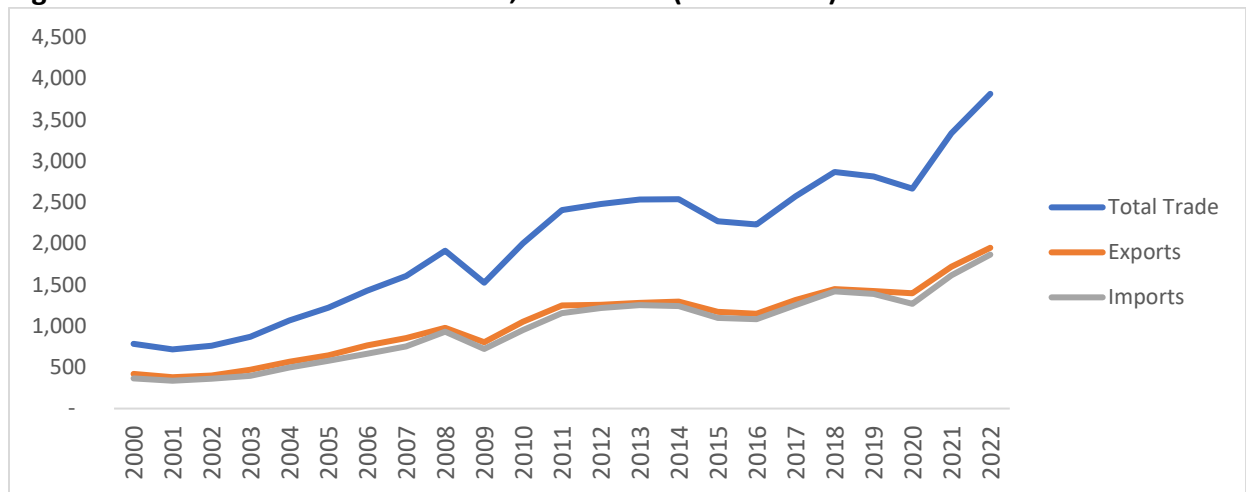


After the 2008-2009 financial crisis, total trade and exports followed a generally upward trend until around 2014, after which there was a period of relative stability.

From 2017 onwards, trade surged again, with both exports and imports showing a significant increase. This could be attributed to global economic recovery and Southeast Asia's increasing role in global value chains, especially in sectors like electronics and manufacturing.

The recent surge 2021 to 2022 is likely due to the global recovery from the COVID-19 pandemic, increased demand for Southeast Asia's exports, and rising imports driven by industrial activity and consumer demand as economies reopened.

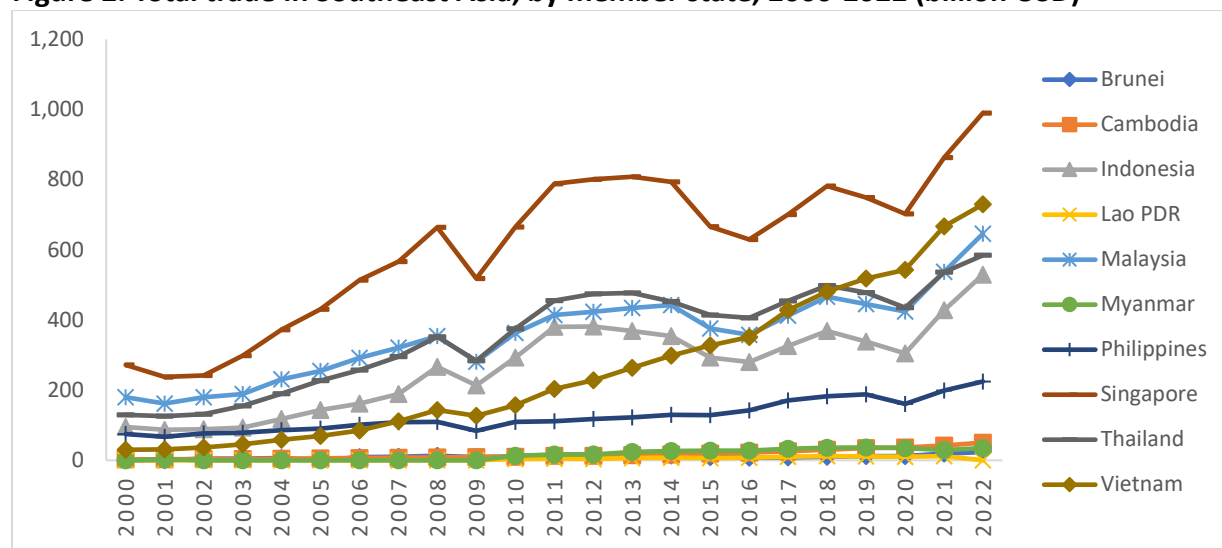
**Figure 1. Total value in Southeast Asia, 2000-2022 (billion USD)**



Source: Authors' construct

Figure 2, on the other hand, compares the trade across ASEAN members. The Philippines' total trade has steadily increased from around 50 billion USD in 2000 to 225 billion USD in 2022. The overall growth reflects the country's increasing integration into the global economy, driven by factors such as industrialization, export growth, and import demand. Despite the upward trajectory, the Philippines' trade growth is relatively modest compared to countries like Vietnam and Singapore. This suggests that the Philippines has not grown its trade sector as rapidly as its more dynamic neighbors, particularly Vietnam, which has experienced a manufacturing boom.

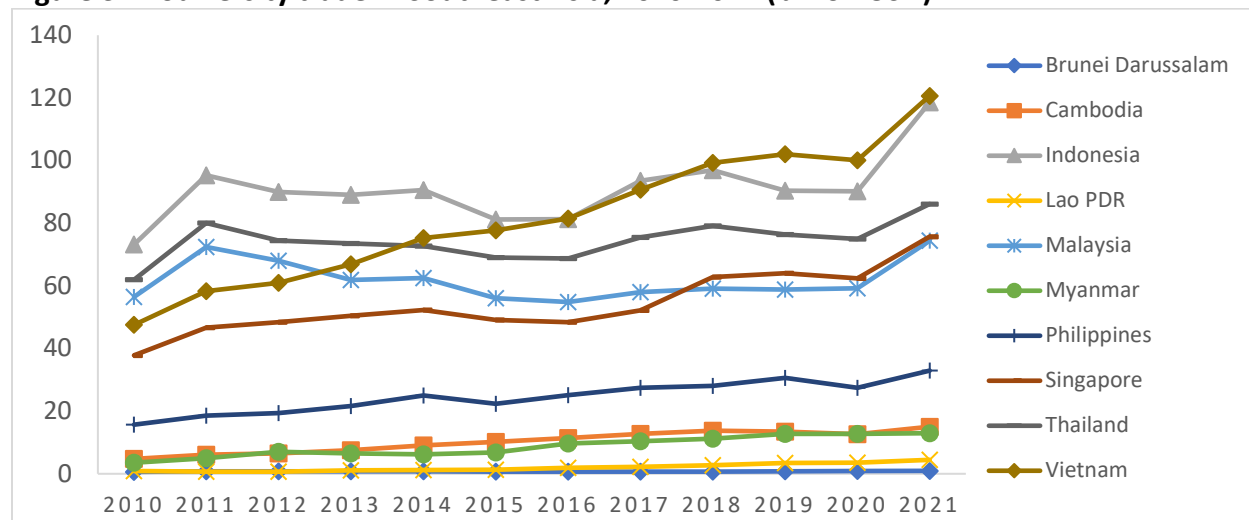
**Figure 2. Total trade in Southeast Asia, by member state, 2000-2022 (billion USD)**



Source: Authors' construct

Trade in biodiversity products vary across member states. Vietnam and Indonesia are the largest players. Vietnam saw a dramatic increase, reaching 121 billion USD in 2021. Indonesia also exhibits significant growth, reaching 119 billion USD in 2021. The Philippines shows steady but lower levels of trade, reaching about 33 billion USD by 2021. While it has seen gradual growth, the country lags against regional leaders like Vietnam and Indonesia. This likely reflects the Philippines' slower pace in scaling biodiversity-related industries such as forestry, fisheries, and agriculture (Figure 3).

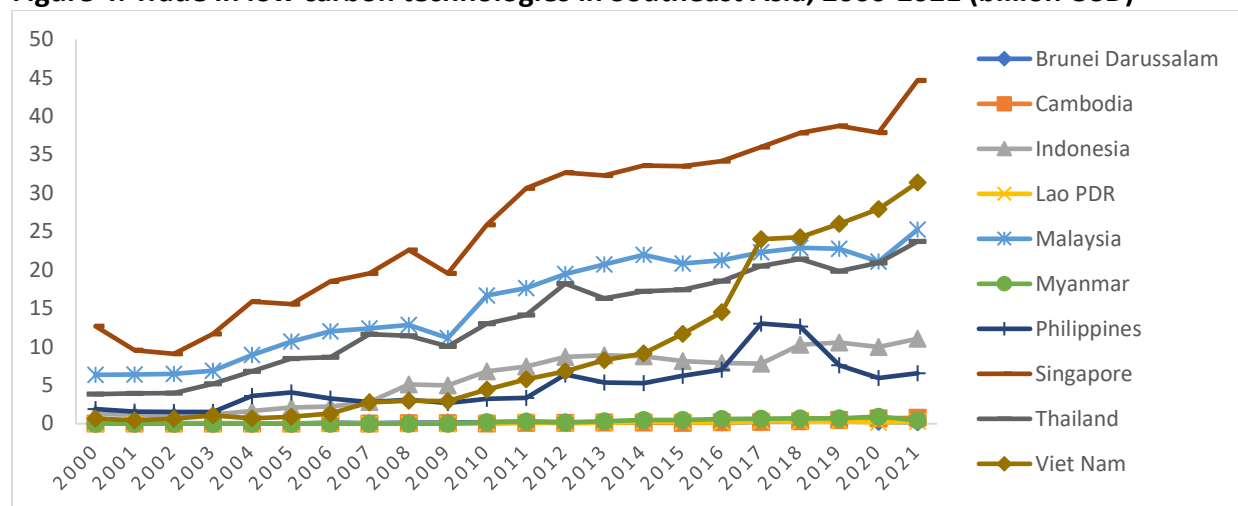
**Figure 3. Biodiversity trade in Southeast Asia, 2010-2021 (billion USD)**



Source: Authors' construct

On the other hand, trade in low carbon technologies shows a steady upward trend, potentially driven by increasing global demand for sustainable technologies and national policies aimed at mitigating climate change.

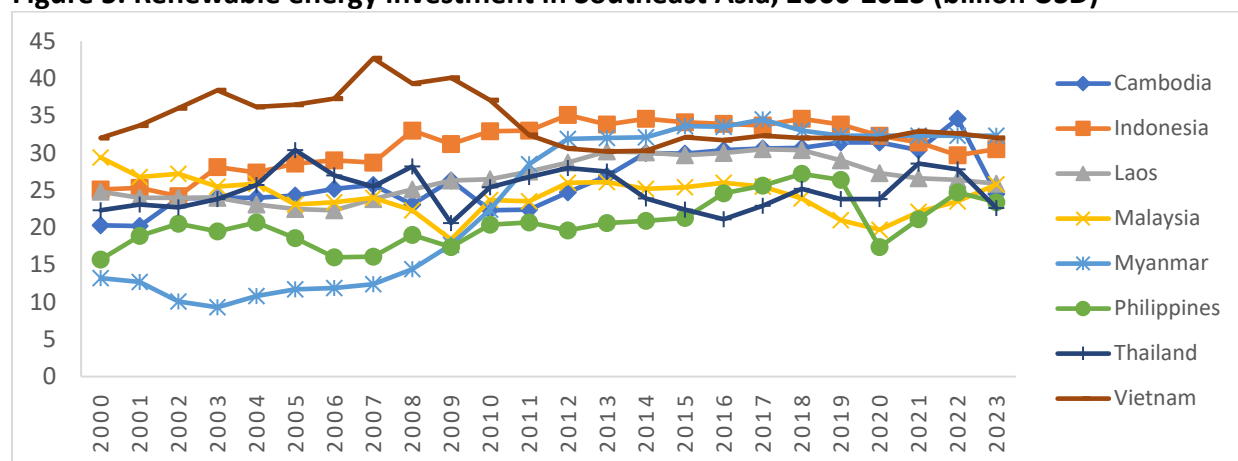
**Figure 4. Trade in low carbon technologies in Southeast Asia, 2000-2021 (billion USD)**



Source: Authors' construct

Lastly, investment in renewable energy (RE) in the region is presented in Figure 5. Vietnam emerges as a leader in renewable energy investment, reaching about 32 billion USD in 2023. The Philippines shows steady but moderate investment, fluctuating around 20 billion USD from 2000 to 2023, indicating consistent efforts in this sector, suggesting the country is maintaining its focus on renewable energy projects but without significant surges in investment. Myanmar appears to have performed better compared to the other members states throughout the period.

**Figure 5. Renewable energy investment in Southeast Asia, 2000-2023 (billion USD)**



Source: Authors' construct

### 3. Environment, Social, and Governance (ESG)

The growing climate issues, bearish economic outlook, and geopolitical instability led ESG principles to be an essential agenda and strategy for achieving the sustainable development goals. With international trade playing a key role, ESG principles are incorporated in trade and investment frameworks to promote inclusive economic growth through a universal, transparent, and rule-based trade system.

In the current deglobalized landscape, businesses face new challenges and uncertainties, prompting the need for adaptive strategies. Key among these strategies is compliance with non-tariff measures (NTMs), ESG norms, and the Sustainable Development Goals (SDGs), especially crucial for MSMEs and exporters. Compliance with NTMs, ESG norms, and SDGs is now indispensable for international market success. Sustainable practices, transparency, and stakeholder collaboration are foundational for MSMEs and exporters, enabling long-term sustainability and competitiveness. Implementing sustainable practices reduces environmental impact and costs, while meeting NTMs ensures competitiveness in foreign markets. Aligning with SDGs not only fosters global development but also attracts socially conscious consumers, enhancing reputation and appeal (Tradepenetrate Pvt. Ltd. 2023).

The relationship between trade and ESG is associated with exposure to competition. Increased competition is likely linked to lower ESG performance of firms, both domestically and due to imports, especially affecting financially constrained and capital-intensive industries. Companies who tend to prioritize other investments over ESG initiatives face heightened competition, challenging the belief that ESG activities confer a competitive advantage. However, firms in regions prioritizing climate action show greater resilience, indicating a willingness to prioritize ESG despite short-term profitability concerns (Pursiainen et al. 2023).

On the other hand, ESG performance influence economic growth. For countries demonstrating better ESG performance, having stronger and more sustainable growth prospects, ESG factors significantly influence long-term economic growth. Although the economic benefits of good ESG performance typically manifest in the long term, some countries experience short-term gains. This underscores the importance of ESG factors in economic development, particularly for developing countries, the role of values such as gender equality, anti-corruption measures, and sustainable resource management in fostering growth is emphasized. Additionally, the environmental dimension emerges as crucial for long-term growth, highlighting the importance of prudent natural resource management to minimize adverse effects such as pollution and climate change risks. The paper emphasizes the need for collective efforts among all stakeholders, including developed and developing countries, to implement ESG policies effectively, with organizations like the OECD serving as platforms for collaboration to find global, coherent solutions (Diaye et al. 2021).

### ***3.1 ESG Principles and Practices***

The existing body of literature and corporate best practices provides significant guidance on drafting sustainability or ESG policies and setting sustainability and ethical objectives (see Society for Corporate Governance, Curley Global IR, LLC, and Carlow Consulting, LLC 2020; NYSE n.d.; and The AIRE Centre and UNDP Bosnia and Herzegovina 2023). ESG or sustainability principles should be included in the constitutional documents of the corporation or, on the flipside, amendment of articles of incorporation to embed terms and sustainable principles in the constitutional documents, exercising various procedural mechanisms in the same manner as any other constitutional change (ICLG 2024 and Thomson Reuters 2021). The best way to legitimize consideration of ESG issues and stakeholders' concerns is to modify their mandate to provide explicit permission and acceptance to boards to consider ESG. Otherwise, in common law or stakeholder-oriented jurisdictions, the consideration of ESG considerations could be seen as a violation of the requirement to serve shareholder interests (Ashley et al. 2021).

Targeting ESG needs to consider three dimensions: purpose, practice, and performance. Purpose emphasizes the need to align company core values and long-term vision with ESG principles, requiring setting a clear corporate vision that considers commitment to sustainability, social responsibility, and good governance. Purpose serves as the guiding principles that help in prioritizing ESG issues that are most relevant to their long-term vision and strategies (KPMG 2020). When ESG purpose is already identified, practice comes next, which involves concrete steps to implement ESG strategies. This pillar involves developing ESG strategies, conducting materiality assessments to identify priorities and focus on relevant issues, and setting KPIs and targets to measure the progress. Essential to this pillar are effective governance structures and risk management practices to ensure that ESG risks and opportunities are systematically addressed. Lastly, performance aspect ensures that the outcomes of ESG initiatives and strategies are monitored and reported. This dimension includes setting measurable goals and targets and providing transparency in reporting (KPMG 2020).

### *3.2 ESG Integration in Business Strategies*

While this paper emphasizes the role of ESG as national development framework, it is important to understand how ESG principles can be leveraged to motivate businesses. ESG has initially evolved as a critical framework that evaluates companies' sustainability and ethical impact. For instance, by prioritizing environmental factors like climate change mitigation and resource conservation, social issues like labor rights and community development, and strong governance practices, companies can enhance their reputation, mitigate risks, and attract investors that are sensitive to environmental and social impacts. Integrating ESG into the core business operations can lead to increased innovation, cost savings, and, in the long run, improve stakeholder relations. ESG integration is aimed at ensuring the ESG factors are considered in the investment decisions and business operations to promote long-term value creation. Companies with strong ESG principles tend to have a more sustainable and responsible business model that address a broader societal purpose. Integration can be done through can be implemented through qualitative and quantitative analysis, such as adjusting financial models to incorporate ESG factors. Incorporating ESG disclosure are also regularly done and should be incorporated into company policies, which require a systematic approach to understand the impact on performance and to make informed decisions that reflect the understanding. ESG integration helps managing risks and identifying and seize opportunities, improving company performance. Strong ESG practices can lead to better management resources, improved employee performance, strengthen the supply chains, and enhanced corporate image (PRI, UNEP, and UNEPFI 2017).

Building a long-term value and resilience in today's evolving business environment requires ensuring that ESG principles are well integrated. Following are some key points to consider (EY 2021):

- Strategic alignment: From merely a compliance issues, ESG has shifted to becoming a core strategic issue on corporate governance, requiring companies to align their business goals with ESG objectives to address not just financial performance but also environmental and social impact. Strategic alignment ensures that businesses are adaptable to uncertainties, including climate change, economic disruptions, and evolving regulatory landscapes.
- Stakeholder engagement: ESG integration becomes effective when it consistently promotes transparent dialogue with stakeholders, which is done through structure reporting

frameworks. This helps establish trust to the business and strengthens business-stakeholder relationships.

- Resilience and innovation: A crucial role that ESG plays is enhancing the resilience of business, especially those that are heavily affected by environmental and social disruptions. For instance, manufacturing and energy industries leverage ESG to drive innovation in sustainable practices, such as green procurement and circular economy.
- Regulatory compliance and competitive advantage: Companies that proactively integrate ESG into their operations and corporate social responsibilities (CSRs) are better equipped to comply with the regulations mandated by the government, attract responsible investment, and gain competitive advantage in global markets (EY 2021).

Lew et al. (2024) enumerates several mechanisms by which companies can benefit from ESG:

- Competitive advantage. Adopting ESG practices can help businesses boost their market position as these practices align with the expectations of consumers and investors for responsible firm behavior. ESG-adopting companies, therefore, can be differentiated from their competitors who may not emphasize ESG initiatives.
- Financial performance. Implementing ESG practices can have positive impacts on financial performance. These are observed as companies who effectively manage environmental, social, and governance risks see an increase in their valuation and reduced costs associated with these risks, including operational and legal risks.
- Reputation and trust. Leveraging ESG principles and adopting ESG standards as part of a company's standards demonstrate commitment to sustainability, which is appealing to stakeholders, not only investors but also customers and employees, contributing to greater customer and employee loyalty.
- Investor attraction. Heeding the urgency of addressing global environmental and social issues, more investors prioritize environmentally and socially responsible investments. Aligning with ESG standards increases the credibility of companies, making them more attractive to investors who seek low-risk, high-transparency opportunities, and therefore helping companies gain easier access to capital.
- Innovation opportunities. The adoption of ESG practices compel companies to reduce environmental impacts and improve their social impacts. To keep pace with global sustainability trends, meeting the standards and maintaining commitments can lead to new sustainable products and services.
- Regulatory compliance. With increasing global regulations, ESG practice help companies to remain compliant with policies, reducing potential legal risks and preparing companies for the evolving regulatory landscapes (Lew et al. 2024).

Similarly, Henisz, Koller, and Nuttal (2019), enumerates how prioritizing ESG has become a critical factor for businesses that seek long-term sustainability and competitive advantage. Companies can unlock significant value through various channels, which are summarized as follows:

- Top-line growth. Having a strong ESG proposition can help companies enter new markets and expand existing ones by enhancing their relationships with regulatory bodies and communities. Positive ESG practices can drive consumer preference for sustainable products and services, increasing sales volumes.

- Cost reduction. As already mentioned, companies can observe reduction in their operation costs when they are able to optimize resource utilization by lowering energy consumption and waste.
- Regulatory and legal intervention minimization. Companies with strong ESG credentials face less regulatory scrutiny and are better positioned to gain government support, enhancing their strategic freedom and reducing the risk of fines or other interventions.
- Increased employee productivity. A strong ESG framework can attract and retain top talent, boosting employee motivation and satisfaction, and therefore productivity. Employees in organizations that have a stronger sense of purpose and social impact are often more productive.
- Investment and asset optimization. ESG-focused companies allocate capital more effectively and invest in sustainable projects that have high long-term returns and low risk associated with unsustainable assets. This helps companies avoid future costs associated with environmental and social liabilities (Henisz, Koller, and Nuttal 2019).

In addition, while the exact impact of ESG on profitability and cost of capital may vary across industries and regions, the overall trend is clear: strong ESG performance can lead to significant financial benefits for companies. As ESG continues to gain importance, companies that prioritize sustainability will likely outperform those that do not.

For instance, Purbasari and Rokhim (2024) demonstrate how ESG ratings impact profitability and capital cost in ASEAN+3, noting that companies in the region are increasingly adopting ESG practices, and that regions with more established ESG practices display stronger correlations between ESG ratings and profitability. Correlating ESG ratings and profitability, measured by return on assets (ROA) and return on equity (ROE), companies with higher ESG ratings are shown to have better profitability metrics, although the correlation remains relatively weak for the region that can generally be considered a late adopter. On the cost of capital, on the other hand, ESG ratings are observed to have significant and inverse relationship with a firm's cost of capital. Higher ESG ratings tend to lower the cost of capital. Firms with strong ESG performance are considered to have lower risk by investors and creditors, who may be willing to offer financing at reduced interest rates or lower expected returns, thereby decreasing the overall cost of capital (Purbasari and Rokhim 2024).

Moreover, the following are key points to consider in the integration of ESG within the context of ethical business practices, sustainable recovery, and stakeholder capitalism (PIDS 2021):

- a. Integration into stakeholder capitalism: ESG principles are positioned at the core of stakeholder capitalism where businesses are encouraged to balance profit-making with social and environmental responsibilities.
- b. Importance of sustainable practices: ESG discussions emphasize the need to comply to ESG principles to address externalities such as pollution and ensure corporate accountability to a broader range of stakeholders.
- c. Corporate governance and ESG: ESG principles are linked to the broader goals of corporate governance in the Philippines, aligning business activities with social welfare and environmental sustainability as outlined in the Philippine Constitution.

- d. Economic and Financial Implications: Companies adhering to ESG principles may experience disparities in valuations due to investor preferences for sustainable practices, with ESG compliance acting as a differentiator in capital markets.
- e. Actionable Guidelines: Businesses are encouraged to adopt ESG policies, including disclosure of environmental impacts, integration of social considerations in decision-making, and promoting inclusivity in economic benefits (PIDS 2021).

### ***3.3 ESG Reporting and Disclosure***

Reporting ESG is recognized crucial to communicate to stakeholders, including investors, customers, and regulators, the sustainability performance of businesses. The disclosure of ESG data helps companies and governments to demonstrate their commitment to sustainability, manage risks, and seize opportunities related to environmental and social issues. Having regulations on ESG reporting and disclosure enhances transparency and accountability that are crucial in building trust and aligning goals and strategies to global sustainability goals. This emphasizes that ESG reporting is not only a compliance issues but a strategic tool that can enhance the reputation and competitiveness in the global market (BSE 2021).

Reporting ESG based on its pillars of environmental impact, social responsibility, and governance practices should focus on materiality to ensure that ESG issues most relevant to the business and stakeholders are reported (KPMG 2023). This does not only ensure that the purpose and objectives of reporting comprehensively answer the *where, why, and for whom*, but ensures that other aspects such as regulatory requirements, stakeholder needs, and ethical values, among others, are considered. This also includes evaluating the options available for ESG reporting and deciding the best course of action, and documenting the decision-making process, ensuring that disclosures are coherent, decision-useful, and aligned with both external reporting requirements and internal strategic objectives. In addition, investors increasingly seek forward-looking information that integrates with financial disclosures, requiring ESG to be not only based on compliance but should provide clear and concise insights on how risks and opportunities are managed to drive long-term value creation. The materiality, clarity and conciseness, and forward-looking dimensions of ESG reporting ensure that the ESG information reported are reliable, verifiable, and comparable (WBCSD 2019).

### ***3.4 ESG in Southeast Asia***

ASEAN is recognizing the importance of ESG in promoting sustainable development and responsible business conduct. With rapid economic growth and industrialization, ASEAN member states are prioritizing environmental conservation, social inclusivity, and good governance as part of their development agendas. This shift towards sustainable and inclusive growth models is reflected in initiatives like the ASEAN Economic Community Blueprint and the ASEAN Vision 2025, which emphasize the role of ESG considerations in advancing regional economic integration, social progress, and environmental sustainability (Tay, Lee, and Yi 2017).

Driven by increasing pressures from stakeholders, investors, and regulatory bodies, ESG reporting in Southeast Asia is gaining traction, and the adoption of ESG is a way to ensure that businesses operate sustainably and responsibly. In a study by Kartikasary et al. (2023), disclosing



environmental, social, and governance dimensions of a companies' operations, in relation to their value, suggests that companies with higher quality ESG reporting have better market capitalization that reflects to their value. Among the dimensions, social dimensions had the most significant impact, suggesting that engagement in social responsibility practices, such as community involvement and human rights, increases a firm' market capitalization. The stakeholder theory also suggests that a company's social responsibility is not limited to their shareholders and customers but also to other stakeholders, including their employees and the broader community. Companies with better ESG management and reporting have better position in attracting investments and enhancing their market value, as investors increasingly look for companies that prioritize sustainability and ethical business practices, underscoring a robust ESG reporting. ESG reporting in the region, however, needs to improve in terms of transparency and the quality of disclosures (Kartikasary et al. 2023). In addition, ESG investment in Asia, including Southeast Asia, remain modest in scale compared to global standards, reflecting the region's slow adoption of ESG reporting and disclosure practices. Another reason is inconsistency, and the lack of transparency caused companies in the region to lag against their Western counterparts. The lack of reporting standards resulted to inconsistent and unavailability of comparable data, making it difficult for investors to assess ESG performance accurately (UNDP 2024).

ASEAN has a number of regional initiatives that promote and support ESG practices among its members (ASEAN-Korea Centre 2023). Among these initiatives are the following:

- ASEAN Taxonomy for Sustainable Finance (2021) – a taxonomy developed by ASEAN Capital Market Forum to provide criteria that can be used to identify sustainable economic activities and support the development of green and sustainable finance within the region.
- Framework for Circular Economy for the ASEAN Economic Community (2021) – a framework that outlines the guiding principles and strategic priorities for circular economy initiatives in the region. This aims to reduce waste and promote sustainable resource use.
- ASEAN Plan of Action for Energy Cooperation (APAEC) (2020) – this initiative is led by the ASEAN Centre for Energy. This promotes cooperation in renewable energy, energy efficiency, clean coal technologies, and nuclear energy, while also facilitating grid and gas pipeline interconnectivity among its members.
- Workplan for Forest Law Enforcement and Governance (FLEG) (2016) – this plan focuses on enhancing sustainable forestry management and developing standards to trace sustainable forestry products.
- ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025 and Sustainable Development Goals (2017) – aims at ending violence against women, promotes involvement of women in governance, and gender mainstreaming (ASEAN-Korea Centre 2023).

Moreover, the ASEAN Green Bond Standards (AGBS) is a significant initiative that supports the issuance of green bonds across ASEAN members, helping them to ensure that green bonds meet international standards and attract global investors (ASEAN-Japan Centre 2019).

### 3.4.1 ASEAN Members ESG Profiles

Countries in Southeast Asia increasingly adopt ESG frameworks and integrate them into their financial and corporate processes, guiding their businesses and investors in the decision-making

processes. Various countries in the region develop their own national policies that mandate or encourage ESG reporting, and that are tailored to address local challenges and priorities (ASEAN-Japan Centre 2019).

In terms of regulations, policies, and practices, Singapore leads in sustainable finance and carbon services, among ASEAN members states. Singapore has mandated sustainability and ESG data reporting for publicly listed companies, which is done through its ESGenome disclosure portal. Singapore's government is also implementing a green plan to achieve net-zero emissions by 2050 (ASEAN-Korea Centre 2023). The Monetary Authority of Singapore (MAS) issues guidelines to require financial institutions to integrate ESG in their risk management frameworks. Singapore has also implemented the Singapore Green Plan 2030, outlining its targets for sustainable development and ESG integration across multiple sectors (ASEAN-Japan Centre 2019).

Indonesia, on the other hand, is also making progress in developing its green taxonomy and in promoting renewable energy. The country is focusing on enhancing its corporate governance and aims to be a leader in electric vehicles (EV) in the region (ASEAN-Korea Centre 2023).

The Philippines is also showing success in ensuring that its publicly listed companies disclose their GHG emissions as part of its goal of improving its sustainability reporting standards to align with international standards.

Malaysia is advancing its ESG adoption by introducing it to MSMEs. To guide sustainable finance and corporate practices, the country introduced a Climate Change and Principle-Based Taxonomy (ASEAN-Korea Centre 2023). The Bank of Negara Malaysia and the Securities Commission also introduced guidelines to promote ESG practices among financial institutions and publicly listed companies. Malaysia also introduced the Sustainable and Responsible Investment (SRI) Sukuk Framework to support green and sustainable finance (ASEAN-Japan Centre 2019).

Thailand also implements various initiatives to promote sustainable development. These include the Bio-Circular-Green (BCG) Economy Model. Similar to Singapore and the Philippines, it has also made mandatory the sustainability reporting among publicly listed companies. Thailand is also making progress in promoting gender equality (ASEAN-Korea Centre 2023). The Stock Exchange of Thailand (SET) promotes ESG disclosures among listed companies and its Securities and Exchange Commission (SEC) launched initiatives to enhance ESG reporting by setting up a task force to develop green taxonomy (ASEAN-Japan Centre 2019).

Cambodia's ESG practices are guided by its Long-Term Strategy for Carbon Neutrality (LTS4CN) and the Cambodia Climate Change Strategic Plan (2014-2023). The Cambodian government implemented the Cambodia Sustainable Finance Principles to boost the country's ESG awareness and adoption (ASEAN-Korea Centre 2023).

Lao PDR focuses on renewable energy, increasing its renewable energy share to a significant level. As part of the government's commitment to sustainable development, sustainable finance and regulations to promote transparency and ESG practices are introduced.

Vietnam has developed its comprehensive regulatory framework that emphasizes on utilizing renewable energy and carbon offsets. It also focuses on sustainable finance, resulting in an increased number in publicly listed companies disclosing their GHG emissions.

Brunei Darussalam, on the other hand, is in the early stages of adopting and implementing ESG practices, which is embedded in its National Economy Blueprint (2021) and the Brunei Darussalam Climate Change Policy (BNCCP). Unlike other members, the country encourages ESG disclosures but does not mandate them. Brunei is also exploring the creation of a carbon credit model.

Lastly, Myanmar is also making progress in environmental progress. The Myanmar Climate Change Strategy (MCCS) and other policies are created to commit to integrating ESG practices, albeit slower pace compared to the rest of the region (ASEAN-Korea Centre 2023).

Some of the notable ESG-related or supportive initiatives of ASEAN members are summarized in Table 1.

**Table 1. ESG initiatives in Southeast Asia**

Country	Main Policies/Regulation/Action			Notable ESG Practices
	Environmental	Social	Governance	
Brunei Darussalam	2020 Brunei Darussalam Climate Change Policy (BNCCP)	Organizing roadshows to increase financial literacy and ESG awareness	National Economic Blueprint	Government is confronting environmental challenges head on by working with stakeholders to develop solutions
	Net-Metering Program	Employment Order 2009	Disclosures are encouraged but not mandated	Government is looking into creating a carbon credit model and determining the pricing for carbon credits.
Cambodia	National Strategic Plan on Green Growth (2013–2030)	National Policy on Lifelong Learning	Cambodian Sustainable Finance Principles	Government has implemented capacity building initiatives to increase ESG awareness: Cambodia Sustainable Agriculture Summit and Cambodia Climate Change Summit.
	Long-Term Strategy for Carbon Neutrality (LTS4CN)	Law on Minimum Wage	Sustainability reporting is not mandatory but has increased over the past 10 years.	Government is exploring opportunities to issue green bonds as there is high demand from investors.
Indonesia	Indonesia Green Taxonomy	Protection of Indonesian Migrant	Sustainability reporting is mandatory for PLCs	Most state-owned banks have either stopped or committed to stop financing new coal-fired power plants.

		Workers Law 2017		
	Just Energy Transition Partnership (JETP)	Domestic Worker Protection Bill	Indonesia Corporate Governance Roadmap 2014	A lot of manufacturers are being recruited to build and invest in EV infrastructure in Indonesia.
Lao PDR	National Green Growth Strategy 2030	Monthly minimum wage has been gradually increased	Corporate Governance Framework	International financing requirements and changing market expectations are driving ESG adoption among companies in Lao PDR.
	National Biodiversity Strategy and Action Plan	Fourth National Plan of Action on Gender Equality (NPAGE)	Sustainability reporting is not mandatory	Government is taking the necessary steps to promote EV usage in the country.
Malaysia	Climate Change and Principle Based Taxonomy (CCPT)	Malaysia Shared Prosperity Vision 2030	Sustainability reporting is mandatory for PLCs	CCPT's qualitative approach to describing climate-related activities has been successful.
	Low Carbon Mobility Development Plan (2021–2030)	Productivity Linked Wage System (PLWS)	Code of Corporate Governance	Government has a number of initiatives to ensure that MSMEs are able to transition to a low carbon economy.
Myanmar	Myanmar Climate Change Strategy (MCCS) 2018–2030	Myanmar Sustainable Development Plan (MSDP) 2018–2030	Companies Law 2018	ESG adoption is driven by needs. E.g., the lack of energy supply and infrastructure is driving companies to adopt renewable energy such as solar.
	New Environmental Policy 2019	No announcements of new social protection policies since 2021 due to recent conflicts	Myanmar has yet to develop its own code of conduct	
Philippines	National Climate Change Action Plan 2011–2028	Migrant Workers and Overseas Filipinos Act of 1995	Sustainability reporting is mandatory for PLCs.	CSR requirement for listed companies has driven ESG adoption.

	Renewable Energy Act of 2008	Diversity and Inclusion Committee	ESG Taxonomy is being developed.	Government is taking steps to improve the current reporting standards to ensure that they are aligned with international best practices.
Singapore	Singapore Green Plan 2030	Progressive Wage Model (PWM)	Sustainability reporting is mandatory for PLCs.	Financial sector is calling for more regulations and guidelines from the central bank to enhance their ESG practices.
	Carbon tax	Local qualifying salary (LQS) requirement	Code of Corporate Governance	Singapore launched ESGenome, a disclosure portal for companies to report ESG data in a structured and efficient manner.
Thailand	Bio-Circular Green (BCG) Economy Model	National Action Plan on Business and Human Rights (NAP) (2019–2022)	Thailand Taxonomy (first draft)	37 Thai companies were included in S&P Global's Sustainability Yearbook 2023, and 12 companies were awarded Gold Class.
	Climate Change Master Plan (2015–2050)	Minimum wage rate increased by an average of 5% in 2022	Form 56-1 One Report	A regulatory body works with social media influencers on Facebook and TikTok to increase financial literacy among young investors
Vietnam	One Strategic Framework for Sustainable Development Cooperation	National Strategy on Gender Equality	Sustainability reporting is mandatory for PLCs.	Start-ups are playing a vital role in the fight against climate change by developing climate solutions.
	National Climate Change Strategy 2050	Gender Affirmation Law	Law on Access to Information 2018	Investors are eager to invest in renewable energy, but they need favorable policies to be in place to make that happen.

Source: ASEAN-Korea Centre (2023, p. 61-64)

Moreover, ASEAN member states have their own ESG disclosure guidelines and regulations. For instance, the following are the ESG disclosure regimes for ASEAN-6 (Pan 2021):

- Singapore – the Singapore Exchange has required all listed companies to publish annual sustainability reports on a comply-or-explain basis, which includes setting out material ESG factors, policies, and performance.
- Malaysia – Bursa Malaysia mandates listed issuers to include a “Sustainability Statement” in their annual reports, detailing economic, environmental, and social (EES) risks and opportunities.
- Thailand – The Thai SEC implemented a Corporate Governance Code that includes ESG considerations, with an emphasis on frameworks that fit a company’s size and complexity.

- Vietnam –The State Securities Commission, in partnership with the World Bank’s International Finance Corporation, has published an ESG guide based on GRI standards to encourage best practices.
- Indonesia – From 2020, the Indonesia Financial Services Authority (OJK) required all listed companies to produce sustainability reports. Financial institutions must submit Sustainable Finance Action Plans, detailing steps to implement sustainable practices.
- Philippines – The Philippine SEC requires public companies to include sustainability information in annual reports on a comply-or-explain basis, backed by a Reporting Template based on Global Reporting Initiative (GRI) and Climate-related Financial Disclosure (TCFD) frameworks (Pan 2021).

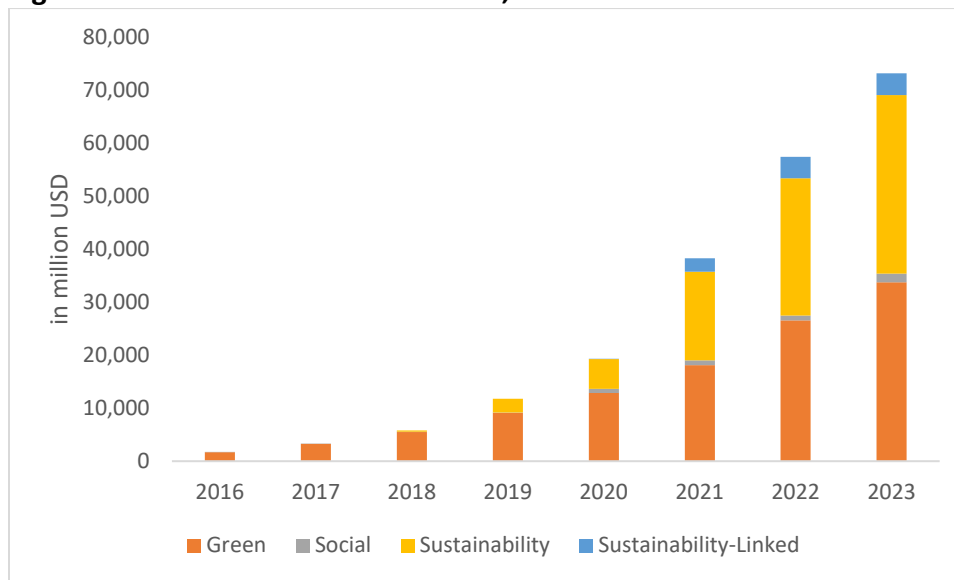
### 3.4.2 Green and Sustainable Bonds

The green and sustainable bonds market in ASEAN have only been introduced. With the introduction of ASEAN Green Bond Standards in 2017 and the ASEAN Social and Sustainability Bond Standards in 2018, the green and sustainable bonds market has significantly increased, demonstrating the commitments of governments in the region (ADB and GGGI 2022).

Outstanding green bonds have the largest share of total green and sustainable bonds market in the region. Green bond was only about 1.7 billion USD and grew to about 33.8 billion in 2023, suggesting a rising interest and commitment towards environmentally focused projects in the region, likely driven by increasing awareness of climate change and environmental issues (Figure 6).

Outstanding sustainability bonds, on the other hand, were only introduced in 2018 with about 221 million USD and have since grown steadily reaching to about 33.7 billion USD in 2023. The sharp increase in sustainability bonds indicates that investors are becoming more interested in projects that encompass both environmental and social goals.

**Figure 6. Sustainable bonds in ASEAN, 2016-2023<sup>2</sup>**

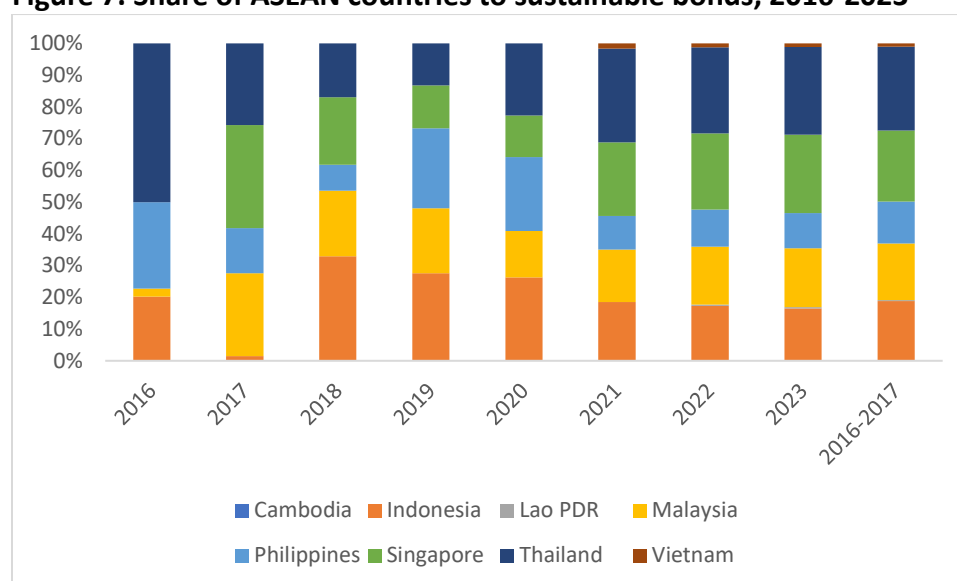


Source: AsianBondsOnline computations based on Bloomberg LP data

The total bond issuance across all categories shows exponential growth, from 1.7 billion USD in 2016 to 73.2 billion USD in 2023. This total growth reflects a significant shift in ASEAN's financing landscape, with sustainability-focused financing playing an increasingly central role. Breaking down by country, Figure 7 shows that Thailand is a major contributor to sustainable bonds (26.5%), followed by Singapore (22.4%) and Indonesia (18.8%).

<sup>2</sup> "Green bonds are debt instruments whose proceeds will be used for the financing of environmental or climate-related projects. Social bonds are debt instruments whose proceeds will be used for projects that will promote enhanced social welfare and improved outcomes for less advantaged populations. Sustainability bonds are debt instruments whose proceeds will be used to support projects that have components of both environmental and socially related projects. Sustainability-linked bonds are bonds with the coupon-rate linked to the firm's sustainability targets." (*AsianBondsOnline* 2024, par. 1).

**Figure 7. Share of ASEAN countries to sustainable bonds, 2016-2023**



Source: *AsianBondsOnline* computations based on Bloomberg LP data

### 3.5 ESG in the Philippines

In the Philippines, the ESG landscape is characterized by a growing emphasis on ESG factors in corporate governance and reporting. While regulations are not codified under a single legislation, there exist various statutory mechanisms that address ESG concerns, such as pollution control laws and labor standards. The Securities and Exchange Commission (SEC) has issued guidelines requiring disclosure of ESG performances in corporate governance reports, and sustainability reporting frameworks have been developed for publicly listed companies. There are also regulations that promote sustainable investment practices, such as the Rules on Sustainable and Responsible Investment (SRI) Funds. Furthermore, foreign supply chain due diligence laws, such as Germany's Lieferkettengesetz (LkSG), have extraterritorial impacts on Filipino suppliers, necessitating compliance with ESG standards. As the Philippines continues to attract foreign investment and engage in global trade, embracing ESG practices becomes essential for businesses to thrive both domestically and internationally, requiring them to navigate a complex regulatory landscape with unique compliance challenges (Aurellano and Pangalanga, in Law Asia Limited, 2024).

In 2019, the Securities and Exchange Commission released Memorandum Circular No. 04, requiring the publicly listed companies to submit sustainability reports to assess their economic, environment, and social performance. Companies are also required to assess their progress towards achieving the SDGs. Moreover, there are several legislations that relate to ESG, including Republic Act (RA) No. 11898 or the Extended Producer Responsibility (EPR) Act of 2022, which requires large companies that produce plastic packaging waste, and the RA No. 11697 or the Electric Vehicle Industry Act, which seeks to ensure energy security and independence from imported fuel (Cabidog/PwC 2023).

The Renewable Energy Act of 2008 supports the ESG principles and initiatives by promoting and utilizing renewable energy sources. The Act is a critical component of the government's



commitment to sustainable and environmental protection. The Act also helps create a favorable investment climate for renewable energy-related projects, guiding investment initiatives to foster transparency and accountability. Furthermore, the Act contributes to social development by providing cleaner energy options that will lead to improved public health and energy security (RA 9153 and National Renewable Energy Program 2020-2040).

The National Renewable Energy Program (NREP) 2020-2040 in the Philippines is the key policy that aligns ESG with sustainable energy development. It is designed to increase the share of renewable energy in the country's energy mix, directly supporting environmental dimensions of ESG by reducing GHG emissions and mitigating climate change. Apart from environmental dimension, the program has also social and governance implications. As it promotes energy access in rural and underserved communities, it is expected to improve the quality of life and provide economic opportunities, fostering social equity and economic inclusion. On the other hand, NREP supports the establishment of transparent regulatory frameworks and policies that encourage investments in renewable energy. Aligning the program with good governance practices ensures accountability and long-term sustainability in the energy sector, not just regulatory compliance.

Another comprehensive framework that is designed to support the country's commitment to address climate change through adaptation and mitigation strategies is the National Climate Change Action Plan (NCCAP) 2011-2028. On environmental dimension, the Plan emphasizes enhancing the resilience of natural ecosystems and communities by improving their adaptive capacities. It also underlines various mitigation actions to reduce GHG emissions, fostering low-carbon growth and encouraging the use of renewable energy. The Plan also advocates the sustainable use of natural resources, particularly those that are believed to be vulnerable, including agriculture, water resources, and coastal ecosystems. On social dimension, NCCAP focuses on protecting vulnerable communities from the adverse effects of climate change by enhancing social equity, particularly in disaster-prone and impoverished communities. It aims to ensure that climate actions are distributed fairly and inclusively, protecting the well-being of all citizens. Lastly, the Plan provides institutional strengthening and policy development initiatives by encouraging the integration of climate change considerations into national and local development plans, promoting good governance, transparency, and accountability, which are key elements of governance. Further, NCCAP promotes stakeholder engagement to ensure the active involvement of not only government agencies but also local communities, private sector, and civil organizations, in the formulation and implementation of climate strategies.

The Philippine ESG agenda can be summarize into four focused areas, covering environmental, social, governance, and sustainable finance. On environmental focus, the country addresses climate risks by increasing the share of renewable energy, promotion of low-carbon technologies, and increasing climate resilience through various programs like the Climate Change Expenditure Tagging (CCET), which is the government's mechanism to track, monitor, and report on the allocation of funds for climate change-related programs and projects, ensuring transparency and accountability in climate finance. On social focus, the country expands opportunities for education, healthcare, food security, and social protection, ensuring that sustainable development benefits all segments of the society. On governance, country extends efforts to strengthening governance and accountability, enhancing transparency, participatory governance, and integrity of public

institutions. Lastly, the government initiates programs to advance sustainable finance, such as the issuance of green bonds (BSP 2024).

#### **4. Sustainable Development Goals (SDGs)**

The General Assembly adopted the 2030 Agenda for Sustainable Development in September 2015. The Agenda includes 17 Sustainable Development Goals (SDGs) and 169 targets. Its main goal is that all countries, in cooperation with various stakeholders, implement the 2030 Agenda, including bringing the world sustainably to the future, taking into account the past and considering people, planet, prosperity, peace, and partnerships. With its headquarters in Bangkok, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), as the regional economic arm of the United Nations, was established in 1947 and this region currently encompasses 53 member states and 9 associate member states (UN 2015).

Sustainable development is a central theme in Asia and the Pacific region. There has been a consensus that sustainable development encompasses a balance of economic, social, and environmental dimensions, and that without stability, peace, or security, alongside humans (and their talents), prosperity, and partnerships, and cooperation, sustainable development cannot be solved. Digital innovation is leveraged to advance sustainable development in the region. Digital technologies foster inclusive growth, reduce poverty, and accelerate the implementation of 2030 Agenda by promoting digital inclusion, reducing digital divides, and ensuring equitable access to digital technologies. This is especially emphasized to least developed, landlocked developing, and small island developing states, highlighting the importance of providing support for vulnerable countries and the role of cooperation and partnership to overcome challenges related to sustainable development (ESCAP 2024).

##### **4.1 Brief History of Sustainable Development**

The concept of sustainable development began with the 1972 Stockholm Conference when a landmark international event was organized by the United Nations to tackle environmental diplomacy. The Stockholm Declaration outlined the principles of environmental protection and sustainable development, emphasizing the interconnectedness of humanity and the environment (Chasek 2020).

This was followed by the 1987 landmark publication of the “Our Common Future”, or popularly known as the Brundtland Report, of the World Commission on Environment and Development. This publication introduced and popularized the concept of Sustainable Development, defining it as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Our Common Future/The Brundtland Report, p. 37). The Report aimed to address growing concerns about environmental degradation and social inequalities and exclusion resulting from unchecked economic development. It also highlighted the interconnection among environment, society, and economy as the key to ensuring the well-being of both current and future generations (UN 1987 and UN n.d.).

About five years later, the United Nations Conference on Environment and Development (UNCED), more commonly known as the 1992 Rio Earth Summit, was held. This historic

gathering of world leaders in Rio de Janeiro, Brazil, along with other representatives from various groups and organizations, put forward two main objectives of environmental protection and sustainable development. The Summit resulted in the formulation and adoption of 27 principles of sustainable development; the Agenda 21 action plan for sustainable development; the Convention on Biological Diversity (CBD), which aims to conserve biodiversity, ensure sustainable use of its components, and promote fair and equitable sharing of benefits from genetic resources; the United Nations Framework Convention on Climate Change (UNFCCC), a treaty negotiated, primarily to stabilize greenhouse gas emissions; and, the Statement of Forest Principles. The Rio Declaration provides fundamental principles that guide nations in making future decisions and policies, considering the environmental implications of socio-economic development (UN n.d.).

A decade later, in 2002, the Johannesburg Summit reaffirmed sustainable development, promoting “partnerships” as a non-negotiable approach to sustainability. This was followed by the UN General Assembly’s endorsement of the UN Decade of Education for Sustainable Development (ADB 2012).

In 2005, the Kyoto Protocol entered into force to legally bind developed countries to greenhouse gas emissions and established the Clean Development Mechanisms for developing countries (ADB 2012).

In 2008, at the onset of the financial crisis, UNEP introduced the Global Green New Deal as a strategy for green energy and technology-led economic recovery (UNEP 2009).

The 20<sup>th</sup> anniversary of the Rio Summit in 2012 focused more on the green economy in the context of sustainable development (ADB 2012).

In Asia, the Association of Southeast Asian Nations (ASEAN) Green Charter was adopted in 2005. It is a declaration endorsed by ASEAN member states, aimed at promoting environmental sustainability within the region's economic development strategies (Singapore MOFA 2024 and ASEAN 2024).

Around the 2010s, different national green economy strategies sprouted in Asia, with South Korea being among the first to produce its own green economy format. South Korea’s 2008 Green Growth Policy was launched to promote sustainable economy development with investments in renewable energy, green technologies, and low-carbon industries as the main strategies (Seong 2011).

In the same year, Thailand also adopted its Climate Change Master Plan (2010-2019), outlining climate change mitigation and adaptation strategies by promoting renewables, energy efficiency, and sustainable land use. This was later replaced by the Climate Change Master Plan (2012-2050) (Nachmany et al 2015).

Other strategies include India’s 2008 National Action Plan on Climate Change (Anderson 2023, FAO 2008), Japan’s 2009 Cool Earth 50 Plan (Kikkawa 2009), Malaysia’s 2010 Green Technology Master Plan (KeTTHA 2017), Vietnam’s 2012 Green Growth Strategy (LSE 2024), the Philippines’ 2011 National Climate Change Action Plan (EMB 2011), and Singapore’s Sustainable Singapore Blueprint 2009 and 2015 (NCCS 2009), and Indonesia’s 2017 Low Carbon Development Initiative (Bappenas 2019).

In 2015, the United Nations adopted the Sustainable Development Goals (SDGs), also known as the Global Goals, as a successor agenda to the Millennium Development Goals. The SDGs are built upon five core principles, known as the "5 Ps": People, Planet, Prosperity, Peace, and Partnership. This comprehensive agenda aims to address critical global challenges by 2030. Firstly, the "People" principle focuses on ending extreme poverty and hunger, ensuring that all individuals can fulfill their potential in dignity and equality. Secondly, the "Planet" principle emphasizes protecting the Earth from degradation through sustainable consumption and production, sustainable management of natural resources, and urgent action on climate change. Thirdly, the "Prosperity" principle seeks to ensure that all human beings can enjoy prosperous and fulfilling lives, with progress occurring in harmony with nature. Fourthly, the "Peace" principle promotes fostering peaceful, just, and inclusive societies, free from fear and violence. Finally, the "Partnership" principle calls for mobilizing global solidarity and collaboration to implement the agenda, focusing on the needs of the poorest and most vulnerable. The SDGs represent a universal call to action to achieve these five core principles by 2030, creating a better and more sustainable future for all (Hughes et al 2021).

In 2016, the G20 Finance and Central Bank Deputies adopted the Green Finance Study Group in Sanya, China, under China's G20 Presidency. Co-chaired by the United Kingdom, and supported by UNEP as secretariat, this marked a crucial step in promoting green investment, signifying Asia's growing influence in global financial markets and its commitment to sustainable development financing (G20 Green Finance Study Group 2016).

During the 2020's, the COVID-19 pandemic prompted countries to develop recovery plans, with calls to incorporate green policies, to align recovery efforts with sustainability goals (Suriyakietkaew and Nimsai 2021).

## **5. Interplay between Trade, Investment, ESG, and SDGs**

The previous sections set out the current landscape of Southeast Asia, its key economic drivers, and selected trade and investment initiatives alongside the various agreements on ESG and SDGs that set the framework for stepping up public and private initiatives in promoting a trade-investment nexus that has ESG and SDGs at its core.

National laws, sustainability standards, and international trade and investment agreements together create and shape the incentives that guide choices towards economic, social, and financial values, and therefore short-term and long-term outcomes which influence each other. Internationally operating investors also sell their goods and services in the host country from the perspective of corporations serving customers whose consumer characteristics typically include ESG behaviors. This interlinkage leads to ever-increasing interest in achieving ESG targets which are aligned with no-harm concerns that different international trade and investment legal frameworks could raise if not handled well.

ASEAN has always worked towards complementing multilateral efforts to liberalize and facilitate the movement of goods, services, investment, and businesspersons in the region. The linkages between a regional trade agreement and investment liberalization initiatives have also been clearly recognized both for political reasons – given the belt of distrust that the world has in the only

partially open world economy – and for business reasons – especially in a global supply chain, a number is not just a numerical restriction, but a cost advantage for investors.

The context – or economic aspects – of how ESG and SDGs interplay within the discussions that either take place during the RTA and BIT negotiations or subsequently once agreements are part of members' legal framework must be part of an economic approach to law. Therefore, private and public stakeholders who tend to resist including debates on how key aspects such as access to healthcare and education, the absence of oppression/lack of discrimination, and gender equal chances in the workplace relate to trade negotiations are urged to accommodate these topics to ensure that public governance addresses the approximate balances between public and private norm-making initiatives. This raises considerable operational questions and will influence relevant germane stakeholders and their objectives that can be rationalized with traditional trade and investment-related issues.

The interplay between trade, investment, and ESG plays a crucial role in driving sustainable development. Trade and investment are fundamental to economic growth and contribute to environmental sustainability and social well-being when aligned with ESG principles. This alignment ensures that economic development does not come at the expense of the environment or society, thus supporting the achievement of SDGs.

In Southeast Asia, the integration of ESG into trade and investment strategies has gained significant momentum. The region has increasingly prioritized sustainable investment to achieve long-term economic resilience while addressing environmental issues, evident in the region's initiatives to promote green investments, responsible and accountable business practices (UNDP 2024, and ADBI 2024 and 2020).

The integration of ESG factors into trade practices and investment decisions help ensure that economic growth is not only robust but also equitable and environmentally sustainable. As ESG provide crucial insights into the long-term vulnerability of companies in their operational practices, environmental impact, and social responsibilities, investors, who prefer long-term and more stable investments, are given more informed decisions on which investments they are going to support (ADBI 2020).

Trade can have significant environmental impacts, such as pollution and resource depletion. Having ESG integrated into trade practices fosters trust and accountability, ensuring that companies operate responsibly, transparently, and observe ethical business practices that promote environmental stewardship, social well-being, and fair labor practices.

Moreover, integrating ESG standards in trade addresses the growing demand for ESG-compliant products and services, creating new market opportunities for businesses that prioritize sustainable practices (ADBI 2020).

Further, foreign direct investment (FDI) is recognized as a potential tool to contribute to sustainable development by introducing innovations and enhancing local capacities. However, it is essential that FDI is aligned with ESG principles to prevent exacerbating environmental degradation or social inequalities. The challenge remains in fully integrating ESG into the regional

policy frameworks and investment strategies to maximize its impacts on sustainable development. While FDI can bring economic advantages, it also has the potential to cause environmental damage, exploit labor, and create social upheaval if not carefully overseen. Incorporating ESG factors into FDI plans helps reduce these risks, making sure that investments support the sustainable development goals (SDGs) of the host country (WEF 2023 and UN 2019).

There are growing efforts to develop frameworks facilitate sustainable investment. The World Economic Forum (WEF) has been involved in piloting sustainable investment projects that facilitate sustainable investment, such as creating supplier database to match ESG capital with sustainable businesses. Such frameworks are part of a broader global effort to ensure that FDI supports the 2030 Agenda (WEF 2023).

Moreover, in ASEAN, a number of ESG-related initiatives are put forward to achieve inclusive and sustainable growth (ADB 2024). These initiatives can be categorized into the following strategies:

- a. Investing in a low-carbon economy: This focuses on transitioning to low-carbon economic by promoting investments in clean energy, low-carbon technologies, and decarbonization efforts; and fostering a conducive policy environment that supports these investments and ensures regulatory certainty for climate-friendly assets.
  - i. Energy transition mechanism (ETM) aims to accelerate the retirement of coal plants and support nuclear alternatives.
  - ii. Promotion of renewable energy by increasing its share in the energy mix.
  - iii. Decarbonization of industries by adopting low-carbon technologies in key industries, such as manufacturing and transportation, e.g. encouraging the use of electric vehicles (EVs).
- b. Developing climate finance: This underscores the importance of having a robust climate finance frameworks to support sustainable projects.
  - i. ASEAN Taxonomy for Sustainable Finance provides a framework for classifying investments according to their environmental sustainability, to guide investors in making decision that align with the region's sustainability goals.
  - ii. Green bonds and financial instruments are issued to raise capital for projects that contribute to climate resilience and environmental sustainability.
  - iii. Capacity building in climate finance is conducted to enhance the capacity of financial institutions and regulatory bodies in understanding and managing climate-related financial risks.
- c. Comprehensive system transformations: ASEAN fosters comprehensive transformations to support sustainability across various sectors through regulatory measures, financial incentives, and capacity building. These efforts include enhancing policy frameworks to encourage sustainable practices and aligning financial instruments with energy transition.
  - i. Regulatory frameworks for sustainability are updated to support sustainable practices across sectors; include setting standards for energy efficiency, waste management, and sustainable agriculture, among others.

- ii. Incentives for sustainable businesses, such as tax breaks, subsidies, and grants, are offered to businesses that adopt sustainable practices. These promote the reduction of firms' environmental impacts and the development of green industries.
  - iii. Capacity building and education are also initiated to enhance skills and knowledge on sustainability issues.
- d. Enhancing multilateral cooperation: ASEAN is deepening engagement and leveraging international partnerships to align with the broader sustainable development goals. This includes collaborating on issues related to climate change and energy transition.
  - i. Deepening ties and collaboration with G20 to align regional efforts with global initiatives.
  - ii. Partnerships with international organization such as the Asian Development Bank (ADB) and the United Nations (UN) to access technical assistance, funding, and knowledge-sharing opportunities.
  - iii. Regional integration and cooperation initiatives are promoted to enhance regional cooperation issues like energy security, climate resilience, and disaster risk management. This is done through joint projects, share infrastructure investments, and coordinate policy development across ASEAN.
- e. Supporting circular economy transition: These strategies embed circularity in manufacturing processes to reduce demand for natural resources and to develop secondary material market in key sectors like construction.
  - i. Circular economy roadmaps are developed and implemented to outline strategies for reduce resource consumption and waste generation on key sectors such as manufacturing, agriculture, and construction.
  - ii. Development of secondary material markets to promote recycling and repurposing of materials. This includes developing standards and certification for recycled products.
  - iii. Waste management and recycling programs are also implemented to improve waste management. This includes the promotion of waste-to-energy conversion and increasing public awareness (ADB 2024).
  - iv.

## **6. Trade, Investment, and ESG in Decarbonization**

Trade and investment play important roles in the efforts to decarbonize industry. Trade drives industry decarbonization by facilitating access to low-carbon technologies and services, creating markets for green products, and reshaping industrial supply chains.

### **6.1 ESG and Decarbonization**

During the last decade, ESG is increasingly integrated into national policies as a sustainability framework. The environmental component of ESG focuses on energy utilization, pollution control, and transition to cleaner technologies. Governments are increasingly prioritizing environmental performance by encouraging cleaner production and optimizing resource use, directly affecting energy consumption patterns. With ESG as a national policy, industries are compelled to shift from

the use of fossil fuels to renewable energy, thereby reducing carbon intensity in production (Long and Feng 2024).

The environmental component of ESG directly addresses how companies manage their environmental impact and carbon footprint. ESG policies push industries to monitor and control their emissions by adopting environmentally friendly practices and technologies. ESG principles help companies transition to renewables and realize long-term sustainability by mitigating climate change risks (Barrata et al. 2023).

The success of adopting ESG as a decarbonization strategy, however, depends on several factors, including public awareness and governance. Governance performance and how governments implement the policy, particularly in fostering accountability and transparency of industries (Long and Feng 2024). Governments not only act as a policy maker or regulator, who, as a central body, set and enforce ESG standards to drive decarbonization across industries, but also, in themselves, are operators and implementers of large-scale green energy infrastructures that directly impact the environment (KPMG 2022). Strong governance performance and institutional efficiency can promote effective implementation of standards, reduce corruption and enhance resource allocation for green initiatives (Long and Feng 2024). On the other hand, increasing public awareness encourages companies to adopt transparent environmental practices, and engage ESG into their operations (Barrata et al. 2023).

As ESG scores provide forward-looking metrics that help investors assess climate transition and risk opportunities. Companies' plans to shift to renewable energy, reduce emissions, and manage risks related to climate change, provide investors information on the capacity of companies to mitigate climate change risks and operate sustainably in the long run (OECD 2021). Green investment and finance lead to sustainable business performance, and as well as corporate social responsibility (CSR) practices can improve access to green financing and investment, leading to improvement in sustainable performance (Ye and Dela 2023). Investment in CSR and practices directed toward ESG issues contribute to sustainable economic development.

Moreover, ESG investing is instrumental in shifting capital away from carbon-intensive industries toward more sustainable sectors. Green bonds, climate transition portfolios, and other climate-related financial products, offer investors avenues to support the climate transition while pursuing financial returns (OECD 2021).

ESG as a national framework are essential for driving the decarbonization of industries by promoting environmental stewardship, engaging stakeholders, and ensuring strong governance. Integrating ESG in industrial strategy can reduce their carbon emissions and access new financial opportunities that support long-term sustainability and climate goals.

## ***6.2 Trade and Decarbonization***

Trade and decarbonization interact in three mechanisms. First, decarbonization impacts the size of and structure of trade (Bekkers et al 2023). As economies transition to low-carbon technologies, such as EVs, renewable energy technologies, and high energy-efficient products, the demand for fossil fuel-based products declines, reducing the overall volume of carbon-intensive goods such as



coal, oil, and natural gas. Consequently, as countries transition to cleaner energy sources, such as solar, wind, and hydrogen, global trade in fossil fuels is expected to decline. This also, therefore, changes the types of goods and services that are traded, as renewable energy, environmental goods, and green technologies will expand. In addition, the implementation of carbon pricing mechanisms, such as carbon border adjustment taxes, will influence trade patterns by making carbon-intensive imports more expensive, while incentivizing green and cleaner products.

Second, trade affects the development impact of decarbonization. When effectively managed, decarbonization can drive sustainable development as it can promote the creation of new economic opportunities in green industries, enhancing energy security, and promoting cleaner environments. Countries that participate in the global trade of low-carbon technologies can benefit from increased access to clean energy that leads to long term economic and social benefits (Bekkers et al 2023 and CCA 2021).

Trade in low-carbon technologies, however, can exacerbate disparities in development outcomes. Countries who are heavily dependent on fossil fuel exports may experience setbacks as demand for these products decline. Similarly, coal-dependent economies may face revenue and job losses as fuel-based industries downsize. On the contrary, countries who have more capacity to produce renewable energy sources and green products may potentially see economic gains. These unequal development impacts may also highlight the role of trade to facilitate access to international financing mechanisms, carbon markets, and technological innovations, which are crucial for developing economies, who are usually fossil fuel-reliant, to transition to low-carbon (Bekkers 2023).

Third, trade facilitates decarbonization by promoting technology transfer, promoting supply chains, and promoting global cooperation. The diffusion of green technologies and innovations across borders allows countries with less technological capability to adopt cleaner energy options, facilitating and easing their transition (ADB 2024, Bekkers 2023, and CCA 2021). Trade facilitates the movement of raw materials, components, and finished products that are necessary for manufacturing or building low-carbon technologies. Thus, interconnectedness through trade supports the scaling up of green industries (CCA 2021). Moreover, global cooperation and trade policies offer mechanisms to incorporate environmental standards, establish decarbonization goals, and promote climate resilient-trade policies, and ensuring the level playing field (ADB 2024, Bekkers 2023, and CCA 2021).

Trade cooperation and the adoption of uniform carbon policies and standards are essential in preventing scale effect and carbon leakage. Global trade provides an opportunity to integrate in Global Value Chains (GVCs), increasing production activities, which may cause rise in CO<sub>2</sub> emissions, especially when low-carbon technologies are not widely adopted. This highlights the importance of multilateral trade agreements and environmental provisions in promoting the transfer of green technologies and encourage sustainable production practices without limiting integration into GVCs. On the other hand, having uniform carbon policies, such as fragmented carbon pricing policies, may prevent the transfer of carbon-intensive production to countries with weaker policies and regulations, which can only undermine decarbonization efforts (ADB 2024 and Bekkers 2023).

### *6.3 Investment in Decarbonization*

Similarly, investment plays a critical role in driving decarbonization and transitioning to low-carbon industries by funding the deployment of renewable energy and adoption of energy efficient technologies. As decarbonization of industries, particularly in energy-intensive sectors like manufacturing, may entail significant capital requirement, investment mechanisms to support the transitions make a great deal especially for carbon-intensive developing countries.

According to UNCTAD's World Investment Report 2023, the capital needed to facilitate global energy transition, particularly to fund renewable energy projects, improve energy infrastructure, and phase out fossil fuels, particularly in developing regions, require 2.2 trillion USD annually (UNCTAD 2023). Investments in technologies, such as carbon capture, utilization, and storage (CCUS) and hydrogen fuel are crucial for industries to reduce carbon footprint (IGCC 2023). The significant amount needed for the transition also highlights the important role of private investors, as well as their recognition of the risks posed by climate change and commitment to the net-zero goal. Central to this is the strategic shift of investments from carbon-intensive sectors to sectors that are supporting green transition (UNEP 2023).

The success of investment strategies relies on having a clear sectoral pathway, government support, and policies that align with climate goals (IGCC 2023). Significant barriers also challenge investments in decarbonization. Despite increased investment over the past decades, significant financing gaps, the high cost of capital requirement particularly in renewables, limits the flow of investments into clean technologies, particularly in low-income countries (UNCTAD 2023). This is even exacerbated by uncertainties in policy and regulatory frameworks, such as changes in subsidies or tax incentives, which deter long-term investments. Policy stability and clear transition pathways are necessary for investors to confidently allocate capital towards decarbonization (IGCC 2023).

In addition, despite efforts to attract renewable energy investments, subsidies to fossil fuels remain a significant challenge, distorting market incentives and making it difficult for clean energy projects to compete. Moreover, technology and infrastructure remain inadequate to integrate renewables into national power systems (IGCC 2023 and UNCTAD 2023).

Moreover, investments can also be done in conjunction with twin transition as a strategy for decarbonizing industries. Twin transition is the concept of simultaneous transformation in green transition and digitalization. It emphasizes the adoption of smart, decentralized grids for renewable energy and AI-driven optimizations in energy consumption. AI can be utilized to optimize the operations of renewable energy farms, increasing their efficiency and output. Similarly, digital innovations, including blockchain, can track and verify the sustainability of industrial processes, ensuring compliance with environmental standards (Quimba et al. 2023).

### *6.4 Carbon Pricing in Southeast Asia*

Southeast Asia is among the highly vulnerable regions to climate change, and at the same time a growing contributor of global GHG emissions. In a business-as-usual scenario, the region's emissions could reach to 8 GtCO<sub>2</sub> by 2030, prompting the need to an urgent action and

transitioning to green or low-carbon region. Carbon pricing is seen as an essential strategy that can promote the region's decarbonization and transition to renewable energy sources (Thomas 2023). There are two main mechanisms of pricing carbon. First, carbon taxes are direct taxes imposed on businesses and households based on the amount of CO<sub>2</sub> they emit. This incentivizes reducing pollution by making it more costly. Second, the emissions trading schemes (ETS) or cap-and-trade systems set a cap on total emissions and allow companies to buy or sell emission allowances. This creates a market that enable companies to trade the right to emit CO<sub>2</sub> (The Asia Foundation 2023 and Thomas 2023). The purpose of carbon price is to reflect the damage caused by emissions in the prices of goods and services (Thomas 2023).

In Southeast Asia, Singapore has been implementing a carbon tax since 2019, while Indonesia has started implementing the ETS since 2023. The rest are still considering or developing imposing carbon price, except for the Philippines and Myanmar who remain undecided. The region, however, faces challenges in balancing short-term economic growth with sustainability goals. A uniform and region-wide approach to carbon pricing, potentially through ASEAN and its mechanisms, could help alleviate competitiveness concerns and ensure fair carbon pricing (Thomas 2023).

To demonstrate the effect of carbon pricing policy, an impulse response function (IMF) was estimated to assess the impact of carbon tax on Singapore's consumption.<sup>3</sup> Table 2 presents the summary of the estimation results.

**Table 2. Carbon tax influence on Singapore's consumption**

	Coefficients (std. error)
Consumption (lag_1)	1.004*** (0.043)
Carbon Revenue (lag_1)	1.536*** (0.197)
Inflation (lag_1)	0.002* (0.002)
Dummy (1 - policy is in effect, 0 - otherwise)	-12.540*** (1.608)
Constant	-0.028 (0.479)
R-squared	0.991
Adjusted R-squared	0.987

Note: Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Source: Author's calculations

The results suggest that revenue from carbon taxes could be stimulating economic activity or that the economy is adjusting to carbon taxes in ways that support consumption. While Singapore leads carbon pricing in Southeast Asia, other economies are also following the step. Table 3 presents the status of compliance within ASEAN.

<sup>3</sup> Singapore is the leading country in Southeast Asia that implements carbon pricing.

**Table 3. Status of carbon pricing in ASEAN**

	Instrument name	Type	Status
Brunei	Brunei Darussalam	National	Under consideration since
Darussalam	Undecided	Undecided	2021
Indonesia	Indonesia ETS	National ETS	Implemented in 2023
Indonesia	Indonesia Carbon tax	National Carbon tax	Under consideration since 2021
Malaysia	Malaysia ETS	National ETS	Under consideration since 2021
Philippines	Philippines Undecided	National Undecided	Under consideration since 2024
Singapore	Singapore carbon tax	National Carbon tax	Implemented in 2019
Thailand	Thailand ETS	National ETS	Under consideration since 2016
Viet Nam	Viet Nam ETS	National ETS	Under development since 2017

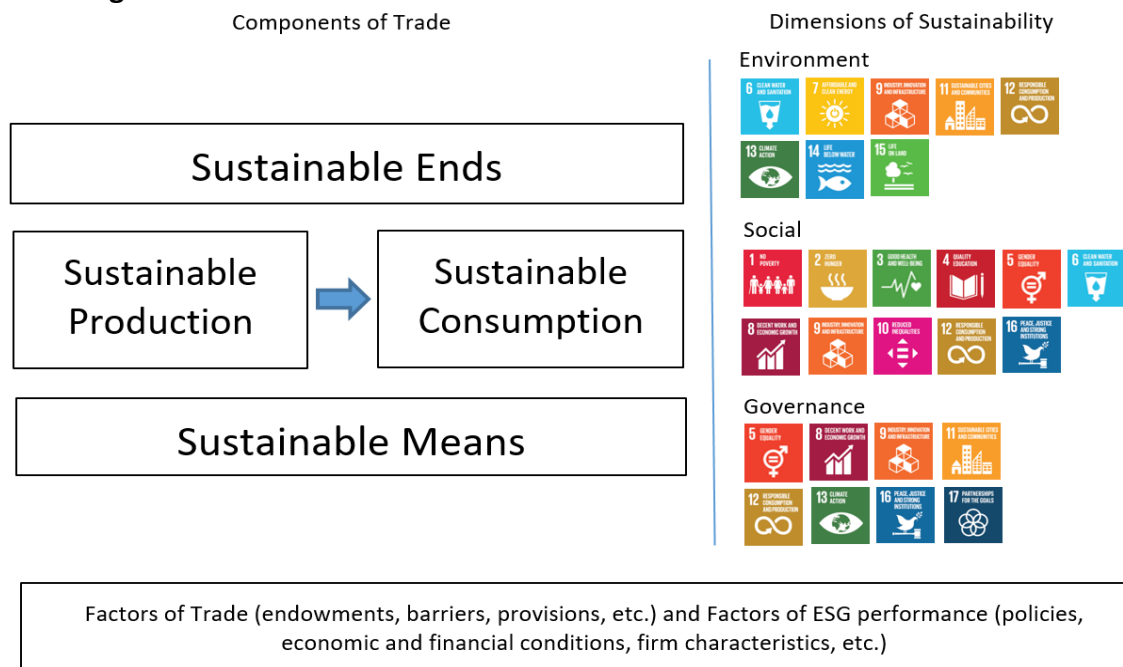
Source: World Bank (2024)

## 7. Methodology

Economic growth determines a nation's position in the international market; however, sustainable development makes sure that this position is upheld among nations. Sustainable development does not imply that the possibility of economic expansion results in a country's social prosperity and the abundant availability of resources with high-quality, healthy living creatures, including humans.

The 17 Sustainable Development Goals proposed by members of the UN General Assembly aim not only to enhance but also to maintain economic development, along with the well-being of society. These goals are categorized into social, environmental, and economic development objectives. However, various environmental, social, and governance challenges may impact environmental conservation, societal welfare, and financial progress within the nation. Investing in addressing these social, environmental, and governance concerns enhances the overall social, environmental, and corporate performance of businesses, thereby contributing to the achievement of all 17 SDGs (Ye et al. 2022).

**Figure 8. Linking ESG to SDG**



Source: Authors' construct, adopted from ICC (2023) and Joh. Berenberg, Gossler & Co. KG (2018), with modifications based on Nemoto and Liu (2020), Fu and Otmame (2022), Pursiainen et al. (2023)

The framework is primarily adopted from the International Chamber of Commerce, which suggests the four components of trade and the dimensions of sustainability (ICC 2023). However, ICC's framework only covers environmental and social dimensions; so, here, it is modified using Berenberg's framework, which categorizes the SDGs according to all the ESG components, including governance (Berenberg 2018).

In ICC, the components of trade include trade proceeds, which are for environmentally sustainable and socially responsible goods and activities, which is translated here as the sustainable ends or purpose of doing trade. The second and third components pertain to the exchange of environmentally sustainable and socially responsible-produced goods between an environmentally sustainable and socially responsible sellers and buyers, which I translated here as the sustainable production and consumption, and, lastly, the means or the environmentally sustainable and socially responsible distribution of the goods.

How trade and ESG, as well as SDGs, interact can be influenced by the factors of trade, including country characteristics, trade information, such as trade barriers, and trade provisions in FTAs, particularly sustainability provisions, among others, and also factors that influence the ESG performance itself, including policies that support the ESG framework, economic and financial status of the country, as well as firm level characteristics, among others.

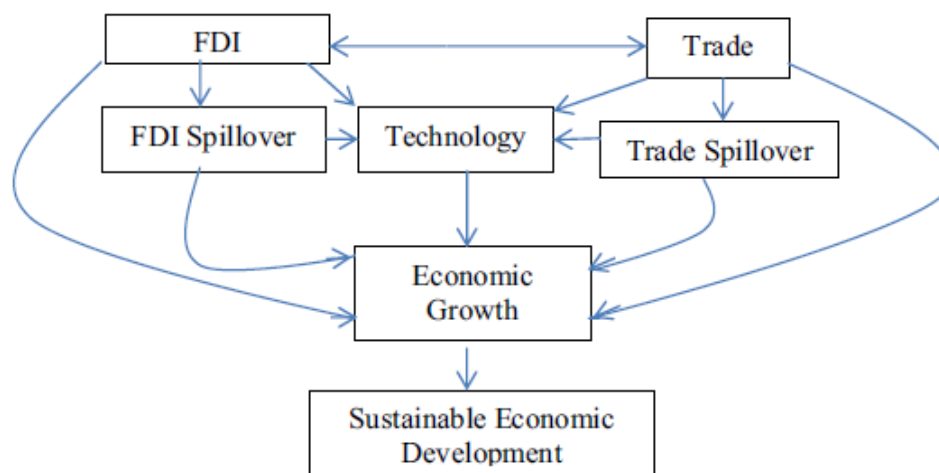
Zhou et al (2023) highlights the direct relationship between ESG performance and sustainability performance. By prioritizing environmental stewardship, social responsibility, and ethical governance, ESG performance leads to improvement in sustainability performance. Similarly,

ESG performance can also stimulate innovation through responsible, efficient, and forward-looking behavior, leading to the adoption of cleaner production processes and eco-friendly products, as well as social responsibility.

Moreover, Zhou et al (2023) shows how innovation acts as a mechanism through which ESG performance is translated into sustainability performance. This suggests that ESG are essential for investment research and development. Investors are also increasingly considering ESG issues when making investment decisions. Sultana, Zainal, and Zulkifli (2018) found that investor preference for ESG issues can impact on economic rationality and the pursuit of returns.

Zamani and Tayebi (2021) present how Foreign Direct Investment (FDI) and trade influence economic growth by facilitating technology transfer, infrastructure investment, and increased trade flows. However, the effectiveness of FDI in stimulating growth depends on various factors and requires a well-designed policy framework. Specifically, achieving quality FDI attraction and institutional improvements can lead to sustainable development through enhanced production processes and positive externalities from FDI and trade.

**Figure 9. Trade, investment, and sustainable development**



Source: Zamani and Tayebi (2021)

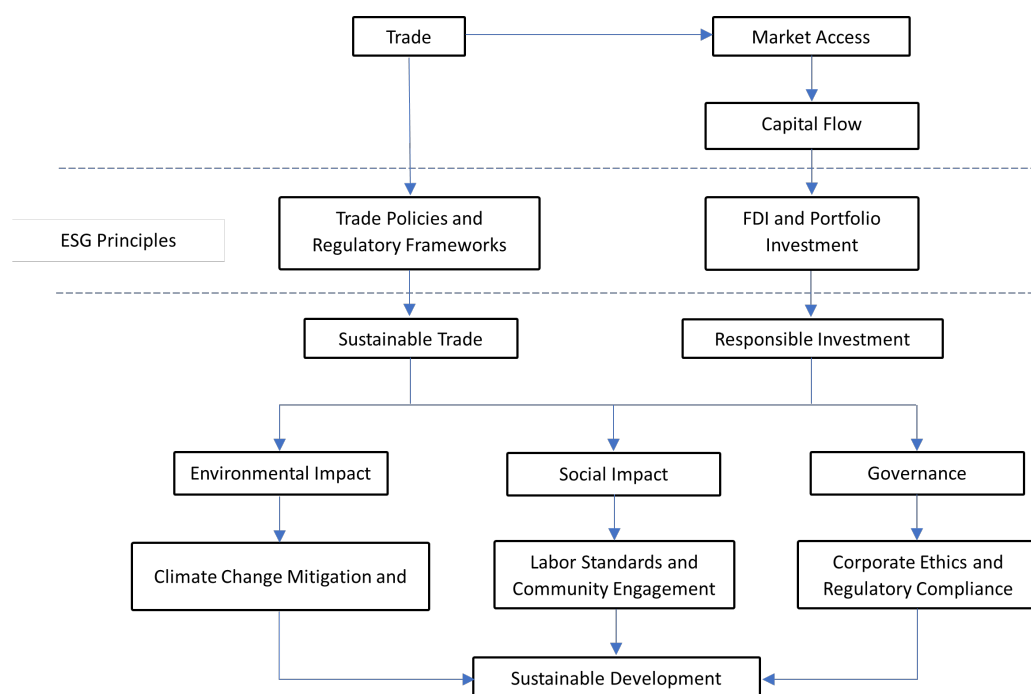
ESG factors can be integrated into the financial sector by developing sustainable solutions in capital and loan markets, such as green bonds, social bonds, and credit facilities. These instruments can support ESG-related projects to incentivize commitments to sustainability (GTR 2021). Green investment and finance lead to sustainable business performance, and as well as corporate social responsibility (CSR) practices can improve access to green financing and investment, leading to improvement in sustainable performance (Ye and Dela 2023). Investment in CSR and practices directed toward ESG issues contribute to sustainable economic development.

These frameworks present the relationship between trade and investment, ESG, and sustainable development. ESG influences trade and investment by shaping risk perceptions, regulatory environment, markets, and innovation incentives. Similarly, trade and investment drive ESG by influencing supply chain practices, technology transfer, and policy alignment on standards set by

ESG principles. The interplay between ESG and trade and investment highlight the importance of integrating sustainability into economic activities to support and promote sustainable development.

Considering these concepts, this paper puts forward the following framework:

**Figure 10. Conceptual framework**



Source: Author's construct

The diagram visualizes the relationships between Trade, Investment, and ESG principles and how these elements collectively lead to sustainable development. Starting with Trade, the diagram shows how ESG principles can be incorporated into trade policies and frameworks, leading to sustainable trade practices, consequently leading to environmental impact (e.g., reducing carbon footprints), social impact (e.g., improving labor conditions), and governance (e.g., ensuring corporate transparency). Trade also provides market access that, in turn, facilitates capital flow. Incorporating the ESG principles into investment enables responsible investment (i.e. foreign direct investment and portfolio investment) that is crucial for channeling funds into sustainable development projects, i.e. funding initiatives that adhere to ESG criteria.

The environmental impact includes addressing climate change and managing resources, while the social impact focuses on maintaining labor standards and engaging communities. Governance emphasizes corporate ethics and regulatory compliance, ensuring that businesses operate transparently and responsibly. Responsible investments, both FDI and portfolio investments, directly support sustainable development by funding initiatives that adhere to ESG criteria. Ultimately, the combined efforts in sustainable trade practices, responsible investment, and strong regulatory frameworks contribute to overarching sustainable development goals, addressing environmental, social, and governance challenges comprehensively.

In other words, the application of ESG principles on trade policies to prioritize environmental protection, social equity, and good governance promotes trade in environmentally friendly goods and services and encourages the adoption of sustainable technologies and practices. Similarly, incorporating ESG factors to assess long-term viability and impact of investments promotes sustainable investment practices. Investors increasingly consider ESG criteria when making investment decisions. Investments in renewable energy, sustainable infrastructure, and social enterprises directly contribute to sustainable development.

To investigate the effect of trade, investment, and Environmental, Social, and Governance (ESG), and the trade-ESG and investment-ESG interactions on Sustainable Development, an Impulse Response Function (IRF) analysis is conducted using a Vector Autoregressive (VAR) model. Following Pfaff (2024), the VAR model takes the following form:

$$y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + CD_t + u_t$$

Where:

$y_t$  = vector of endogenous variables, including the dependent variable

$A_1 \dots A_p$  = matrices of coefficients capturing the relationships between lagged values of the endogenous variables

$CD_t$  = a deterministic constant to capture the baseline level

$u_t$  = the error term representing unexplained shocks to the system

Using a VAR model, the dynamic relationships among trade, investment, ESG, and Sustainable Development are analyzed. This approach helps capture the interdependence and feedback effects between these variables over time. The model estimates how shocks to one variable, such as ESG, propagate through the system and influence Sustainable Development. By leveraging IRF, direction, magnitude, and persistence of these effects are quantified, providing insights into the pathways through which trade, investment, and ESG contribute to sustainable development outcomes.

The paper utilizes the following data:

**Table 4. Data and sources**

Data	Description	Source
SDG Scores	Index scores that measure the total progress towards achieving all 17 SDGs	Sustainable Development Report 2024 (Sachs, Lafortune, and Fuller (2024))
ESG Score	Calculated scores representing national ESG performance	Derived using the sovereign ESG framework of World Bank
CO2 Emissions	Metric ton per capita	World Bank World Development Indicators Database
Biodiversity Trade	Trade of products derived from biological diversity, including plant and animal	United Nations Trade and Development (UNCTAD) Data Centre



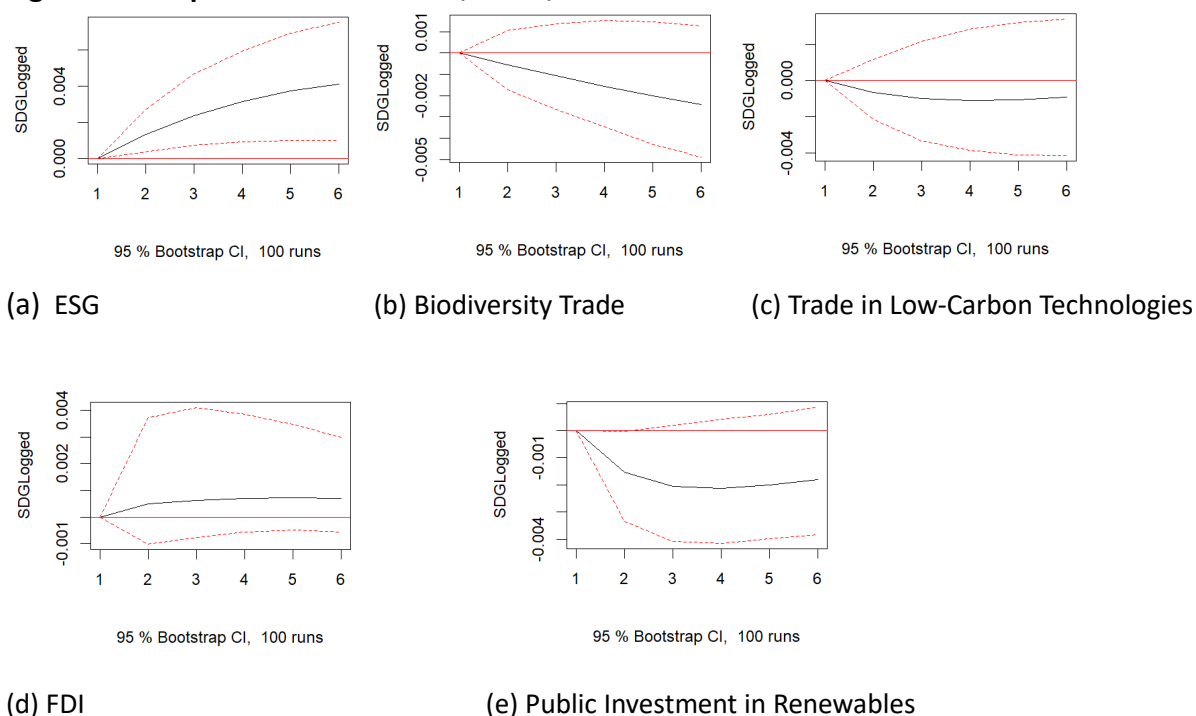
	species, ecosystems, and genetic resources; in USD	
Trade in Low Carbon Technologies	Trade in products that reduce greenhouse gas emissions and mitigate climate change, in USD	United Nations Commodity Trade (UN Comtrade) Database
Foreign Direct Investment	Net FDI inflows, in USD	World Bank World Development Indicators Database
Public Investment in Renewables	Government-led financing and policy support for renewable energy technologies, infrastructure, and projects; in USD	International Renewable Energy Agency (IRENA)
Renewable Energy Investment	Value of RE investment, in USD	Derived based on data from Statista (2024)
Access to Clean Fuels and Technologies	Percent of population	World Bank World Development Indicators Database

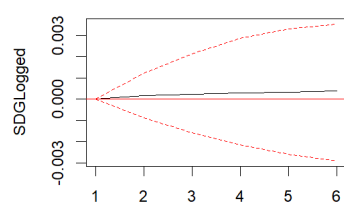
## 8. Results and Discussions

### 8.1 SDG Response to Trade, Investment, and ESG

The following sets of figures are IRF plots showing how SDG scores respond to ESG and trade and investment indicators, as well as the trade-ESG and investment-ESG interactions.

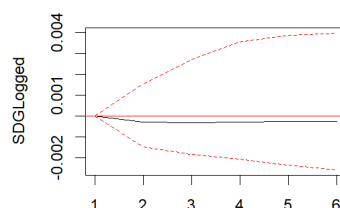
**Figure 11. Response of SDG to ESG, trade, and investment indicators**





95 % Bootstrap CI, 100 runs

(f) Renewable Energy Investment



95 % Bootstrap CI, 100 runs

(g) Access to Clean Fuels and Technologies

Source: Author's calculations

Figure 11 (a) shows that the response of SDG score to the ESG score is close to zero, indicating that there is no significant short-term effect. The response, however, grows steadily over time, indicating that there is a positive and increasing impact of ESG as the effects of the shock propagate. The confidence interval remains high, at above zero, after the second period, indicating that the positive impact of ESG is statistically significant from this point onward.

The figure shows that response is not immediate, indicating that the benefits of ESG take time to materialize, likely due to structural adjustments or lagged implementation effects.

Figure 11 (b) shows that biodiversity trade has also negative but insignificant short-term effect to SDG score. Starting the second period, however, the response of SDG score shows a downward trend, indicating the biodiversity trade has a progressive adverse effect on SDG. The wide confidence intervals indicate some uncertainty but remain below zero at the later periods, suggesting that the negative relationship is statistically significant.

Figure 11 (c) shows that there is no short-term relationship between SDG and trade in low-carbon technologies. The response of SDG becomes slightly negative and stabilizes over time. This indicates that a shock to low-carbon trade has a small, adverse effect on SDG in the medium term, which appears not significant at any point as indicated by zero confidence intervals.

Figure 11 (d) indicates that SDG score has an initial slightly negative but insignificant response to FDI. After the first period, however, the response turns positive and peaks during the second and third periods, implying that increased FDI starts contributing positively to SDG over time, likely due to delayed benefits from investments such as job creation, infrastructure, or social programs. The confidence interval briefly moves away from zero between the second to fourth period, suggesting that the positive response might be statistically significant, but this should be interpreted cautiously. The response of SDGLogged gradually levels off in the later periods (starting the fifth period), stabilizing at a small positive level, with confidence intervals that widen and overlap with zero, suggesting that the long-term effect is not robustly significant.

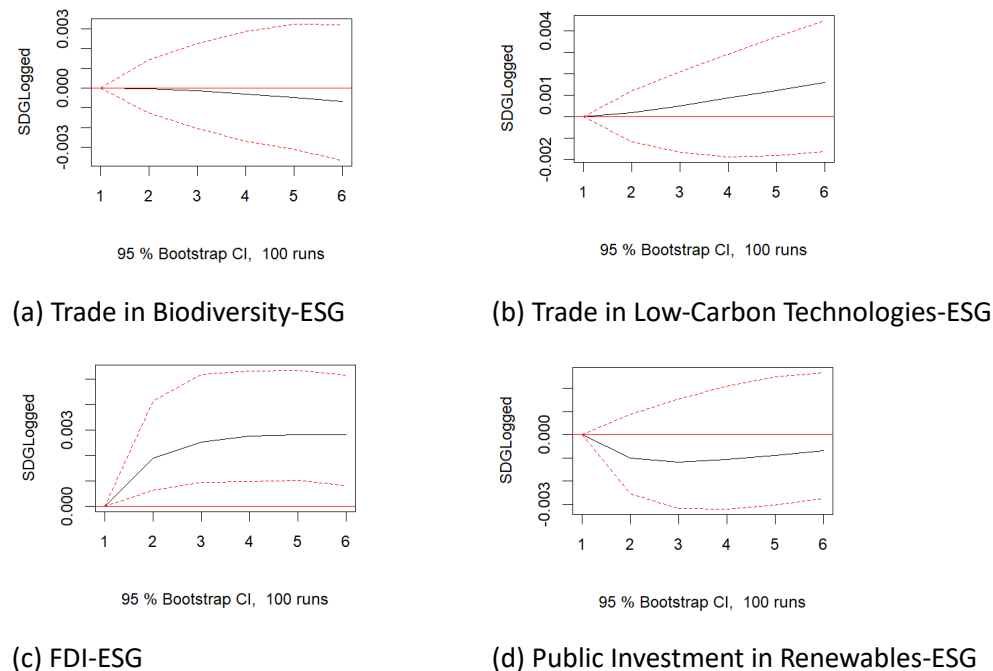
Figure 11 (e) shows that the immediate response of SDG score to public investment in renewables is negative but insignificant. The negative response becomes more pronounced and significant over the next few periods, and reached its lowest around the second and third periods. During the later periods, starting period five, however, the response begins to recover and moves closer to zero, suggesting a diminishing negative effect over time. The confidence intervals become wider, overlapping with zero, indicating the long-term effect statistically insignificant.

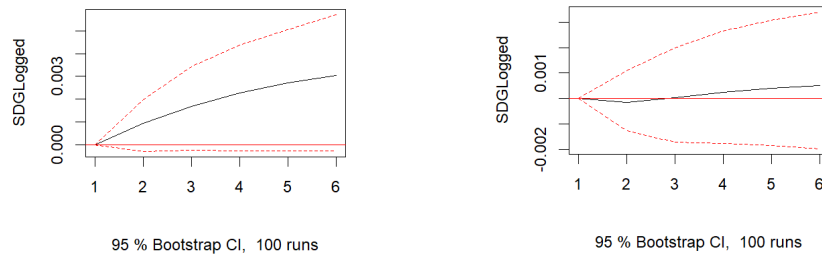
Figure 11 (f) shows that SDG score has no immediate significant response to renewable energy investment. In the short-term (between periods 2-4), the response shows a slightly positive trend, indicating a gradual improvement in SDG score, but this remains insignificant. The positive trend in the response continues and stabilizes in the long-term, indicating a modest improvement in SDG as a result of increased renewable energy investment. The long-term response, however, is also not significant.

Lastly, Figure 11 (g) shows the response of SDG score to access to clean fuels and technologies, where there is no immediate and not significant positive short-term response. In the long-term, the positive response stabilizes, suggesting gradual improvement in SDG as a result of increased access to clean fuels and technology. The confidence intervals, however, widen further but still overlap with zero, indicating that the long-term effect is also not robustly significant. Improvements in access to clean fuel and technology may take time to reflect in measurable SDG outcomes, such as better health, reduced emissions, or economic development. While access to clean technologies is crucial for sustainability, its direct contribution to SDG indicators might be influenced by other factors, such as policy frameworks, socioeconomic conditions, or complementary infrastructure.

The paper further investigates the response of SDG to trade and investment indicators interacted with ESG (Figure 12).

**Figure 12. Response of SDG to trade-ESG and investment ESG-interactions**





(e) Renewable Energy Investment-ESG (f) Access to Clean Fuels and Technologies-ESG

Source: Author's calculations

Figure 12 (a) shows the response of SDG score to a unit shock in the interaction of biodiversity trade in ESG score. The figure does not show any immediate response. There is a slightly negative but not robustly significant short-term and long-term response.

The inclusion of ESG moderates the adverse influence of biodiversity trade on SDG, highlighting the importance of aligning trade practices with ESG principles and practices likely enhancing sustainability, reducing resource exploitation, and promoting governance standards that align with SDGs. Despite the mitigation, however, the response remains slightly negative, indicating that challenges in biodiversity trade (e.g., environmental degradation, unsustainable resource use) still affect SDG outcomes.

Figure 12 (b) shows the response of SDG score to trade in low-carbon technologies, where there is a slightly negative by insignificant response. In the short run (periods 2-4), the response slightly improves, reflecting that the combined influence of low-carbon trade and ESG begins to contribute positively to SDG outcomes. The positive response becomes more pronounced over time, although the result suggests that response trend is not robustly significant in the long run.

Figure 12 (c) shows the response of SDG score to the interaction of FDI and ESG. There is no immediate significant response, however, there is a significantly positive and steady response in the short-term that is sustained in the long-term. The inclusion of ESG considerations eliminates the initial negative response observed in FDI alone, resulting in a quicker and more positive contribution to SDG outcomes. The response with ESG considerations appears more robust, as the confidence intervals suggest a higher likelihood of significance.

For public investment in renewables, Figure 12 (d) shows that there is a minor adverse but insignificant response. In the short-term, this response persists significantly. In the long-term, however, the negative response is mitigated over time, although not robustly significant. The inclusion of ESG considerations reduces the magnitude of the initial negative response and facilitates a faster recovery. ESG may help public investments in renewables better align with SDGs, mitigating short-term disruptions and enhancing long-term sustainability.

Figure 12 (e) shows the response on renewable energy investment. The plot shows that there is positive but insignificant response. In the short-term (periods 2-3), the response is becoming more statistically meaningful, which appears to be stabilizing in the long-term. The inclusion of ESG principles amplifies the positive influence of renewable energy investments, leading to faster and stronger alignment with SDG outcomes. The combined variable demonstrates a more pronounced

and sustained positive impact on SDG outcomes, highlighting the importance of ESG in renewable energy initiatives.

Finally, Figure 12 (f) shows how SDG score response to access to clean fuels and technologies. The Figure shows there is negative but not significant immediate response. The response improves in the short-term but remains insignificant, indicating that access to clean fuels and energy combined with ESG considerations begins to show benefits for SDG outcomes. This, however, remains insignificant. In the medium- to long-term, the response becomes increasingly positive but is not robustly significant as the confidence intervals remain wide and include zero.

To provide a more granular understanding of the influence of trade, investment, and ESG, and their interactions on sustainable development, IRF also calculated using individual environmental, social, and governance SDG scores with corresponding environmental, social, and governance ESG dimensions. Appendix 1 provides the results of the IRF plots.

Appendix 1.1 presents the IRF plots for the response of environmental SDG score to trade, investment, and environmental ESG score, and their interactions. The results indicate that environmental ESG, trade in low-carbon technologies, and renewable energy investment strongly and positively drive environmental SDG outcomes, while access to clean fuels and technologies and public investment in renewables have moderate positive influence. On the other hand, trade in biodiversity has a minimal or slightly negative impact, suggesting potential risks from biodiversity trade practices that are not aligned with sustainability goals.

In terms of the response to the interactions of trade, investment, and access to clean fuels and technologies with environmental ESG, overall, environmental ESG enhances their contribution to environmental SDG outcomes, with notable success in areas such as low-carbon trade. Challenges, however, persist in sectors like biodiversity and public investment in renewables.

Appendix 1.2 presents the IRF plots showing the response of social SDG score to trade, investment, and social ESG score, and their interactions. Overall, there is a strong positive response to social ESG and FDI; moderately or slightly positive trajectory over time for low-carbon trade, public investment in renewables, and renewable energy investment; negative response to biodiversity; while negligible response to access to clean fuels and technologies. The IRF plots reveal that social ESG performance and foreign direct investment are the most effective drivers of positive social SDG outcomes, while challenges remain in aligning biodiversity trade with social goals.

Considering the interactions with social ESG dimension, low-carbon trade and renewable energy investment show the strongest positive influence on social SDG score, indicating that low-carbon trade and RE investments aligned with social ESG principles are effective strategies for advancing social SDG outcomes. The interaction of FDI and social ESG, on the other hand, demonstrates significant short-term benefits, likely driven by immediate economic and employment opportunities. Biodiversity trade, even when interacted with social ESG, shows negative influence on social SDG, highlighting the need for better alignment of biodiversity trade practices with sustainable goals. Meanwhile, public investment in renewables and access to clean fuels and technologies show minimal or no impact, suggesting barriers in realizing social benefits from these interactions.

Finally, Appendix 1.3 presents the IRF plots for the response of governance SDG score to trade, investment, and governance ESG score, and their interactions. The plots indicate that governance ESG and low-carbon trade are strong and positive drivers of governance SDG outcome, while public investment in renewables and RE investment are moderately positive contributors. Biodiversity trade, on the other hand, has consistent negative influence, influencing governance challenges in managing biodiversity trade. Access to clean fuels and technologies exhibits no significant positive response, highlighting potential gaps in governance oversight or implementation.

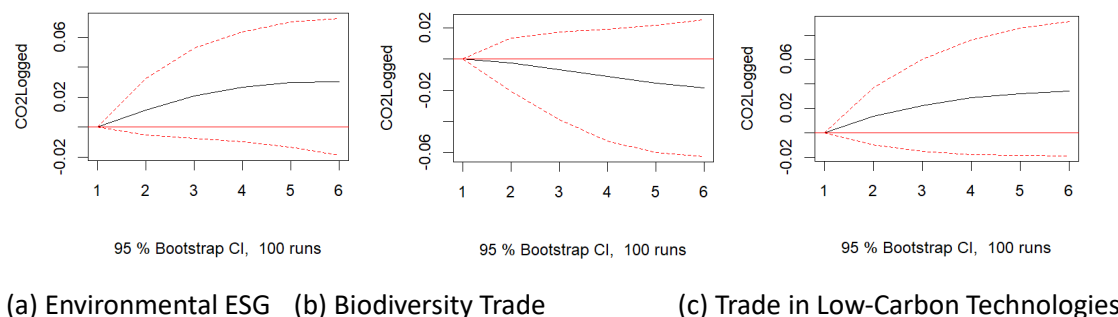
Considering governance ESG interactions, the IRF plots demonstrate that interactions with economic/environmental variables play a crucial role in shaping governance SDG outcomes. Strong governance ESG practices are shown to significantly enhance the impact of public investment in renewables, renewable energy investment, and low-carbon trade, while stabilizes the FDI at moderate level over time. while challenges remain in biodiversity trade and clean fuel access.

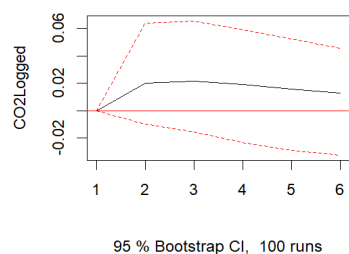
## 8.2. CO2 Response to Trade, Investment, and ESG

Further, the paper conducted an IRF analysis for CO2 response to understand how economic, environmental, and governance factors influence CO2 emissions over time. Conducting IRF analysis for CO2 response complements the analysis of SDG responses by focusing on environmental outcomes, particularly emissions reduction. It provides critical insights into the effectiveness of decarbonization strategies, the role of ESG practices, and the potential trade-offs between economic growth and environmental sustainability. Figure 13 shows the IRF plots for CO2 response.

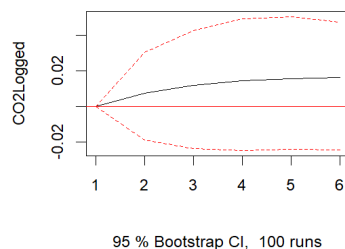
Among the variables, biodiversity trade and access to clean fuels and technologies significantly exhibits strong negative influence on CO2 emissions, indicating their alignment with decarbonization objectives. Meanwhile, public investment on renewables and RE investment show minimal or delayed impacts, indicating the need for improved implantation and upscaling. CO2 emissions, however, has positive response to environmental ESG and low-carbon trade, indicating potential gaps in policy execution or embedded emissions in trade and ESG activities. FDI, on the other, initially increases CO2 emissions, possibly due to infrastructure development or resource-intensive investments, but its long-term associations stabilize with no significant change.

**Figure 13. Response of CO2 to trade, investment, and environmental ESG**

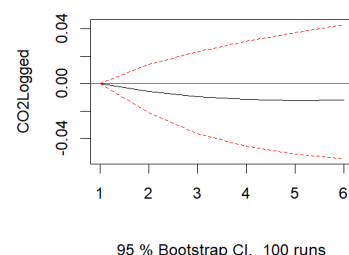




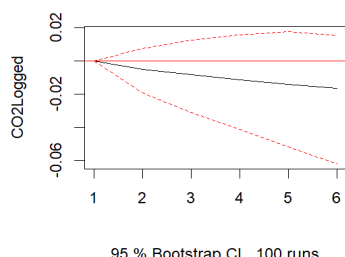
(d) FDI



(e) Public Investment in Renewables



(f) Renewable Energy Investments

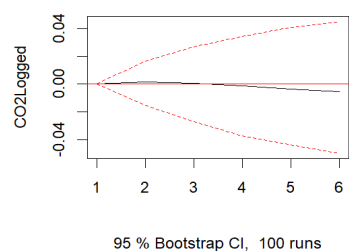


(g) Access to Clean Fuels and Technologies

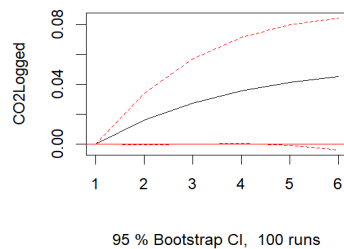
Source: Author's calculations

Finally, the response of CO<sub>2</sub> emissions is also analyzed with ESG-interactions, as presented in Figure 14. The results indicate that the interactions of environmental ESG with biodiversity trade, RE investment, and access to clean fuels and technologies exhibit significant potential in reducing emissions, underlining the effectiveness of clean technologies and biodiversity conservation efforts. Environmental ESG and low-carbon trade interaction, however, presents a counterintuitive positive emissions trend, highlighting the need for deeper examination and adjustments to low-carbon trade policies. Interactions with FDI and public investment, however, show neutral to marginal influence on environmental SDG outcome. Further analysis (Appendix 2) shows that, at longer horizon, environmental ESG, low-carbon trade, FDI, and public investment have slower or delayed benefits in the reduction of CO<sub>2</sub> emissions, highlighting the need for stronger alignment with decarbonization goals.

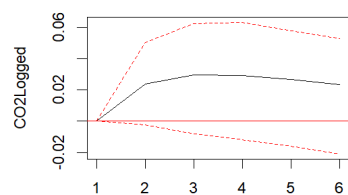
**Figure 14. Response of CO<sub>2</sub> to trade-ESG and investment ESG-interactions**



(a) Biodiversity Trade-Envi ESG

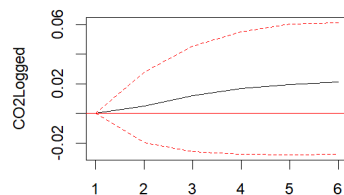


(b) Trade in Low-Carbon Technologies-Envi ESG



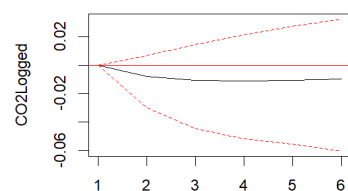
95 % Bootstrap CI, 100 runs

(c) (d) FDI-Envi ESG



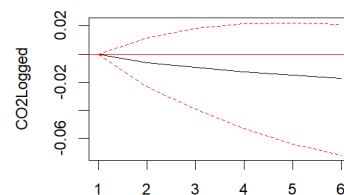
95 % Bootstrap CI, 100 runs

(d) Public Investment in Renewables-Envi ESG



95 % Bootstrap CI, 100 runs

(e) Renewable Energy Investments-Envi ESG



95 % Bootstrap CI, 100 runs

(f) Access to Clean Fuels and Technologies-ESG

Source: Author's calculations

## 9. Conclusion and Recommendations

The paper investigates the relationship between ESG performance, trade, and investment strategies on achieving sustainable development. Through an impulse response function (IRF), it explores how these elements synergize to advance sustainability (and decarbonization), underscoring their potential as economic and strategic tools. ESG is highlighted as a transformative framework that can align market and policy incentives with SDGs, particularly in areas such as green trade, renewable energy investment, and industrial decarbonization. Analyzing the response of SDG is crucial for understanding the dynamics and pathways to sustainable development, providing valuable insights into the short-term and long-term influence of economic and environmental policies.

The positive response of SDG on ESG is not immediate, which highlights the time it takes for ESG initiatives to materialize into measurable improvements in sustainability outcomes. In other words, investments and initiatives aimed at enhancing ESG performance are likely to yield long-term benefits for sustainable development, which means that strengthening ESG frameworks is essential for aligning economic activities with global sustainability goals. Policymakers should focus on strengthening ESG frameworks to support SDG achievement. Governments should mandate ESG reporting and incentivizing business through subsidies, tax incentives, and regulatory reforms, and integrate into national policies, public procurement, and international trade negotiations.

In addition, governments should also harmonize ESG policies. The increasing importance of ESG has resulted to diverse regulatory landscapes, lack of global consensus, and issues on data quality and comparability, leading to a proliferation of standards, frameworks, and regulations. Harmonizing ESG policies is crucial to ensure consistency, reduce compliance costs, and promote global sustainability.



The negative response of SDG to biodiversity trade underscores the importance of ensuring that biodiversity-related trade is managed sustainably to avoid negative outcomes. Trade practices that are not sustainable or that lead to resource depletion or environmental degradation may hinder progress on SDGs. This emphasizes the need for policies to ensure that biodiversity-related trade aligns with sustainability goals, such as through trade certification programs, biodiversity conservation initiatives, and incentives for sustainable trade practices.

The modest and statistically insignificant response of SDG on low-carbon trade indicates the presence of some barriers (e.g. infrastructure, regulatory challenges) that may reduce the effectiveness of low-carbon trade in promoting sustainable development. This suggests that better integration of low-carbon trade with sustainability policies is necessary. Policymakers should therefore ensure that low-carbon trade strategies are well-integrated with broader sustainability efforts, which can be done by incentivizing sustainable practices and minimizing transition costs.

The results for the response to FDI indicates that there is a short-term disruptions or adjustment costs, such as resource reallocation or external dependencies. In the medium term, the response of SDG indicates that FDI spillovers, such as technology transfer, employment, and economy growth, align with sustainable development efforts. The response, however, diminishes over time, indicating plateauing of FDI benefits as the immediate influence are absorbed into the economy. The short-term disruptions can be addressed by creating policies that smoothen the transition for local industries of communities impacted by FDI. Medium-term benefits, on the other hand, can be maximized by channeling investments into sectors that directly contribute to SDGs, such as renewable energy, healthcare, or education. In the long term, the alignment of FDI with sustainability goals should be ensured through incentives, regulations, and monitoring mechanism. For instance, provision of tax breaks and subsidies conditional on adherence to specific environmental and social standards, and preferential treatment for investment in green industries or sustainable technologies; expediting approval process for project that meet sustainability criteria; or facilitating access to green finance and sustainable investment funds and offering low-interest loans or loan guarantees for environmentally friendly projects.

Public investment in renewables resulted to a short-term adjustment cost that initially redirect resources from other sectors or impose transitional costs, leading to a temporary decline in SDG outcomes. Administrative or implementation inefficiencies could also delay the benefits of renewable energy investments. As RE projects become operational, however, their positive influence on SDG indicators (e.g. through energy access, reduced emissions, and economic benefits) could counteract the initial negative influence, leading to a gradual long-term recovery. In order to address the short-term challenges, efficient allocation of public funds should be ensured, minimizing delays, and supporting affected sectors during the transition, while in the long-term, complement public investment in renewables with policies that directly aligned with SDG targets, such as promoting green jobs and improving energy access. Regular assessments of RE projects should also be conducted to identify and resolve bottlenecks that may prolong the short-term negative influence.

SDG's response to renewable energy investments also indicates that it may take some time to translate into tangible benefits for sustainable development. Prioritizing projects that improve access, reduce inequality, or mitigate climate change strengthen the alignment of RE investment with SDGs. In addition, complementing policies that combine RE investments with supportive measures in other sectors to amplify their influence on sustainable development.

On access to clean fuels and technologies, SDG's response is gradual, improving over time, underscoring the need for sustained efforts and complementary policies. Addressing barriers like affordability, infrastructure, and awareness enhances or accelerates the adoption of clean fuels and technologies. Complementary interventions can also help realize the benefits of clean fuels and technologies by combining clean technology initiatives with other SDG-focused policies, such as health programs.

Considering the interactions, ESG considerations generally likely improve the implementation of and outcomes of trade and investment indicators, as well as access to clean fuels and technologies.

Trade, investment, and public spending interactions with ESG principles demonstrate potentials to mitigate the negative response and enhance alignment with SDG outcomes. Biodiversity trade, despite slight mitigation through ESG, retains a slight negative influence, highlighting persistent challenges such as resource exploitation. The interaction with low-carbon trade shows modes improvements in the short-term but lacks robust significance in the long-term. FDI aligned with ESG transitions the initial neutral response to a meaningful positive and sustained influence, emphasizing the importance of integrating sustainability into investment strategies. Public investment in renewables also benefits from ESG alignment, although remains limited in the long-term. Renewable energy investments, on the other hand, is amplified with ESG interaction and demonstrates sustained alignment with sustainable development outcomes. Lastly, access to clean fuels and technologies yield benefits in the long-term upon integration with ESG, although with relatively lower significance.

The paper explores the importance of linking ESG, trade, investment, and SDGs, and why the synergies matter economically. The paper argues that ESG is not merely a corporate or voluntary initiative by a strategic tool that governments can use to optimize economic and social outcomes. The evolution of ESG beyond corporate social responsibility highlights the importance of ESG as a development and strategic tool for governance, such as through tax credits, reporting standards, or subsidies, among other policies. ESG principles are embedded in governance frameworks, especially in ASEAN, through Green and Sustainable Bonds markets, mandatory reporting standards, and carbon pricing mechanisms.

This paper supports the argument of the economic sense of linking ESG with trade and investment that lies in mitigating risks, capturing green market premiums, and reducing capital costs by attracting impact investors. The integration of trade, investment, and ESG can be a key driver in the path towards achieving sustainable development. The following briefly summarizes the arguments:

- Trade and ESG – exporters embracing sustainable practices can gain access to ESG-sensitive markets, unlocking new opportunities. For instance, environmental trade policies (e.g. carbon border taxes) incentivize sustainable production.
- Investment and ESG – Green financing and ESG-aligned investment policies increase the flow of capital into industries advancing SDGs. Impact investments prioritize both financial returns and measurable social/environmental impacts.
- ESG as an economic instrument – as a framework, ESG policies ensures long-term resilience and risk mitigation by managing environmental, social, and governance risks, helping align market incentives with sustainable development goals.

Global trade enables the diffusion of low-carbon technologies and environmental goods, helping industries access the innovations required for decarbonization. Trade agreements and GVCs that promote the exchange of green technologies play a key role in industrial decarbonization.

Similarly, investments, particularly in green technologies and renewable energy infrastructure, are equally important for decarbonizing industry. Private and public investment in cleaner production, energy-efficient processes, and carbon capture technologies, among others, provide the financial backing necessary to allow economies transition to a low-carbon or green economy. ESG-driven investments, such as green bonds and sustainable financing mechanisms, direct capital toward decarbonization projects that ensure industries have the financial capability to meet their carbon reduction commitments.

Green and sustainable bond issuance have shown exponential growth across all categories, reflecting a significant shift in ASEAN's financing landscape, with sustainability-focused financing playing an increasingly central role. The acceleration in bond issuances, most notable after 2020 onwards, indicates an increased urgency around sustainability implicated by global environmental and social challenges, including the COVID-19 pandemic, and underscores ASEAN's growing commitment to sustainability and provides insights into investor preferences for different types of sustainable finance products.

It is, therefore, important to note the complementary role of ESG for national solutions. As a national strategy, ESG can be leveraged by governments to incentivize private sector compliance with SDGs by integrating ESG criteria into public procurement, national investment strategies, and international trade negotiations. In addition, the role of specific sectors (e.g. manufacturing, agriculture, and services) can complement national efforts particularly when sectors are aligned with green trade and responsible investment. In other words, ESG does not replace national policy but enhances policy effectiveness by leveraging market mechanisms and cross-border cooperation through trade and investment policies.

In addition, ESG principles guide the implementation of sustainable practices and ensure transparency and accountability necessary for achieving the decarbonization goals.

Despite ongoing efforts, however, several challenges remain and impede the decarbonization of industry. These include inconsistencies in carbon policies, such as the lack of uniform carbon pricing, which may lead to carbon leakage. Also, the gaps in financing or access to green finance limit the ability of developing countries to significantly reduce carbon emissions. These gaps are exacerbated by high upfront costs for renewables and underdeveloped infrastructure.

Moreover, the temporary reduction in emissions experienced during the COVID-19 pandemic pointed out that merely restraining economic activities is a temporary solution that will not lead to sustainable low-carbon economy.

To overcome these challenges, there is a need to, first, harmonize policies, such as on carbon pricing mechanisms and environmental standards. Governments should work together towards common policies by leveraging trade agreements and other cooperation mechanisms. Second, public and private sector investments must be scaled up, particularly for developing countries. Governments should enhance incentives, such as tax breaks and subsidies, to promote more investments in and adoption of green technologies. Third, adopt ESG as a national framework to intensify industry's commitment to reducing greenhouse gas emissions and improve transparency

in ESG reporting. Governments should work together to invest in capacity building to equip industries with the technical expertise needed to implement decarbonization strategies. There should be greater global cooperation and solidarity to implement immediate, concrete large-scale and long-term strategies, which are necessary to realize a significant reduction in global emissions.

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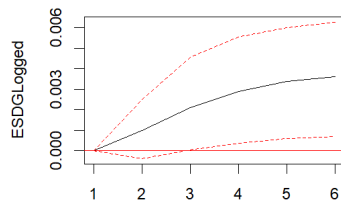
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## 11. Appendices

### Appendix 1. IRF plots of SDG outcomes by dimension, with and without interactions

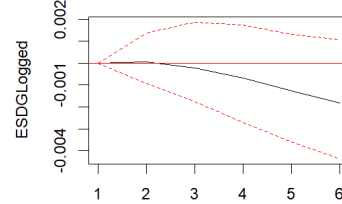
#### Appendix 1.1. Response of environmental SDG, with and without interactions

Orthogonal Impulse Response from EnviESG



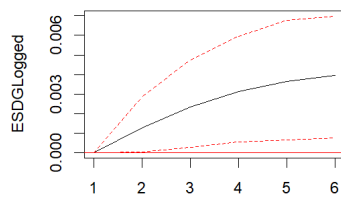
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged



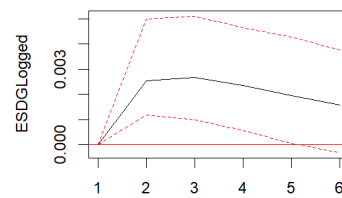
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from LowCarbonTradeLogged



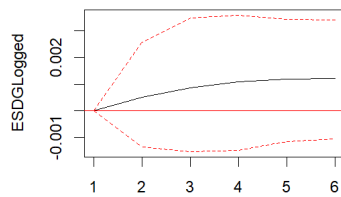
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from FDILogged



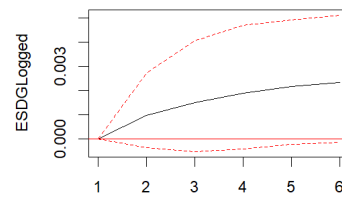
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from PIRenewLogged



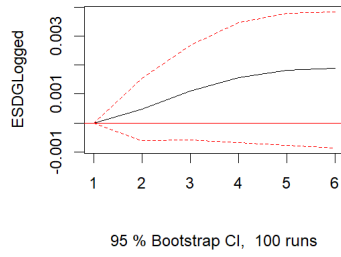
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from REInvestmentLogged

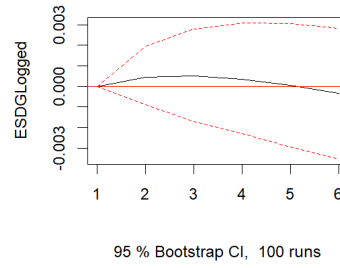


95 % Bootstrap CI, 100 runs

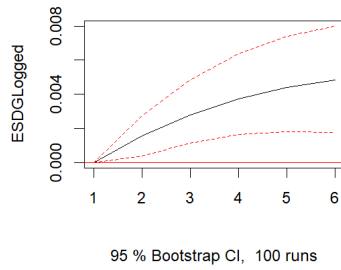
Orthogonal Impulse Response from AccessCleanFTLogged



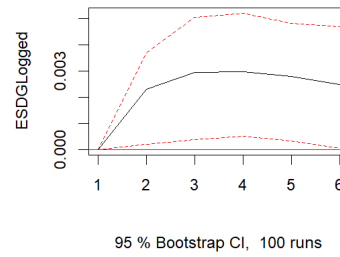
Orthogonal Impulse Response from BioTradeLogged\_EnviesG



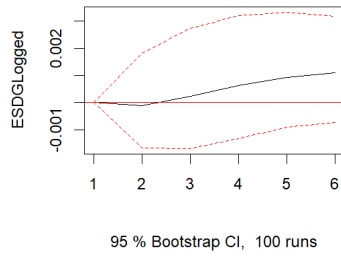
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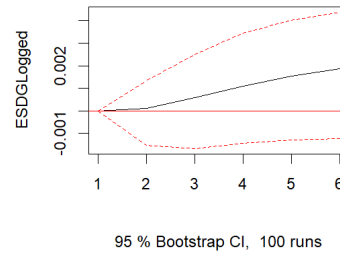
Orthogonal Impulse Response from FDILogged\_EnviesG



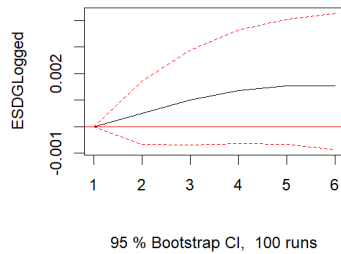
Orthogonal Impulse Response from PIRenewLogged\_EnviesG



Orthogonal Impulse Response from REInvestmentLogged\_EnviesG

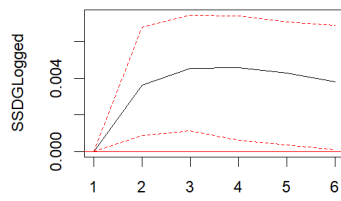


Orthogonal Impulse Response from AccessCleanFTLogged\_EnviesG



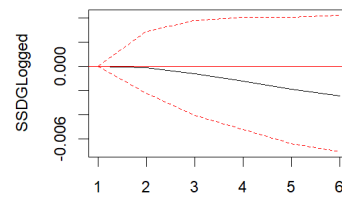
## Appendix 1.2. Response of social SDG

Orthogonal Impulse Response from SocESG



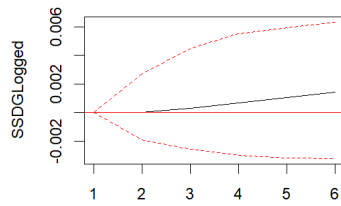
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged



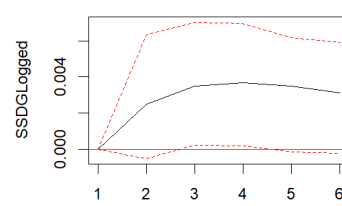
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from LowCarbonTradeLogged



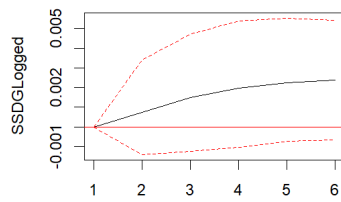
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from FDILogged



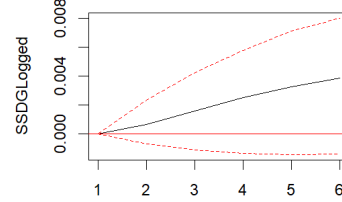
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from PIRenewLogged



95 % Bootstrap CI, 100 runs

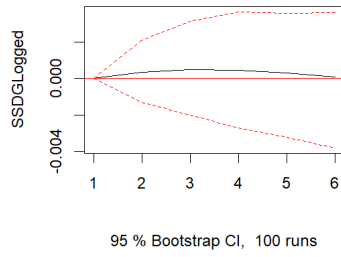
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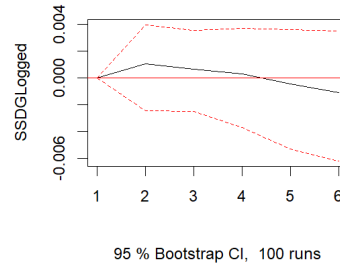
95 % Bootstrap CI, 100 runs



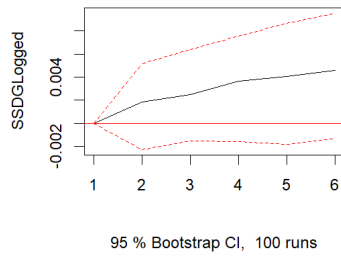
Orthogonal Impulse Response from AccessCleanFTLogged



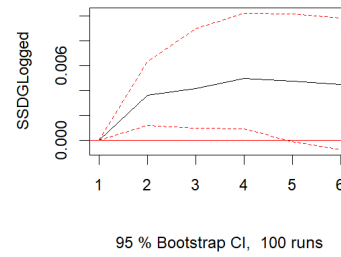
Orthogonal Impulse Response from BioTradeLogged\_SocESG



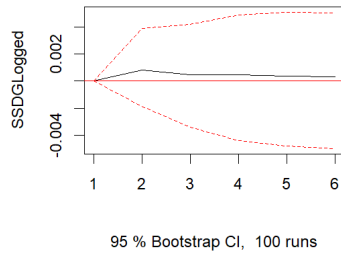
Orthogonal Impulse Response from LowCarbonTradeLogged\_SocESG



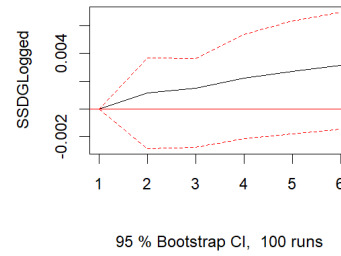
Orthogonal Impulse Response from FDILogged\_SocESG



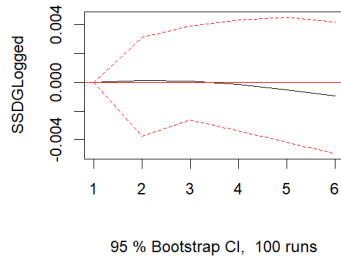
Orthogonal Impulse Response from PIRenewLogged\_SocESG



Orthogonal Impulse Response from REInvestmentLogged\_SocESG

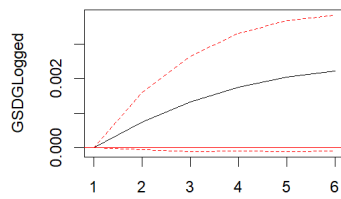


Orthogonal Impulse Response from AccessCleanFTLogged\_SocESG



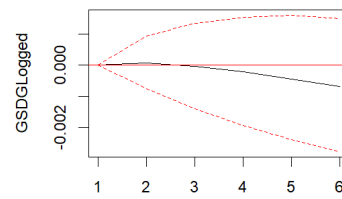
### Appendix 1.3. Response of governance SDG

Orthogonal Impulse Response from GovESG



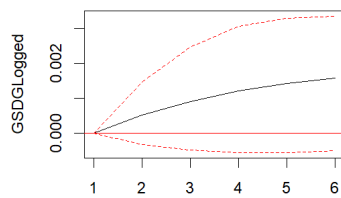
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged



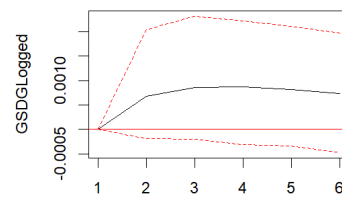
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from LowCarbonTradeLogged



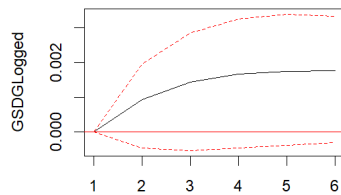
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from FDILogged



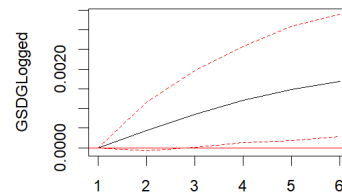
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from PIReNewLogged



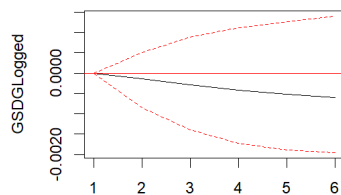
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from REInvestmentLogged



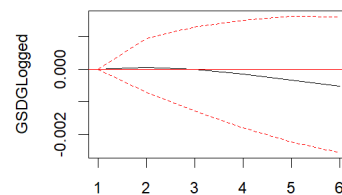
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from AccessCleanFTLogged



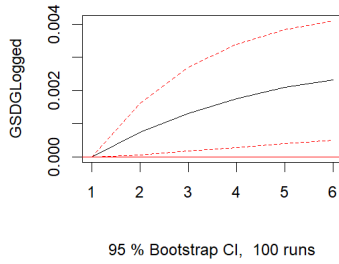
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged\_GovESG

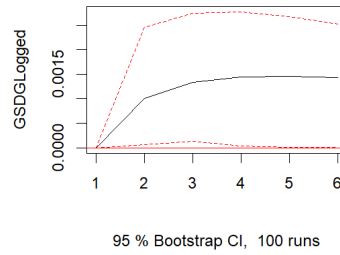


95 % Bootstrap CI, 100 runs

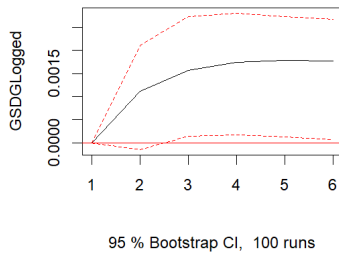
Orthogonal Impulse Response from LowCarbonTradeLogged\_GovESG



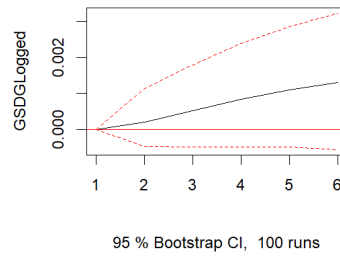
Orthogonal Impulse Response from FDILogged\_GovESG



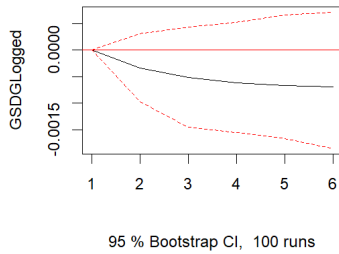
Orthogonal Impulse Response from PIRenewLogged\_GovESG



Orthogonal Impulse Response from REInvestmentLogged\_GovESG



Orthogonal Impulse Response from AccessCleanFTLogged\_GovESG

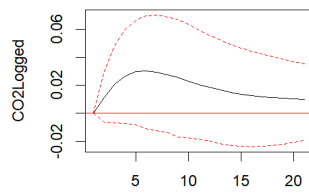


Note: SDG – sustainable development goals score; ESG – environmental, social, governance score; BioTrade – biodiversity trade; LowCarbonTrade – trade in low-carbon technologies; FDI – foreign direct investment; PIRenew – public investment in renewables; REInvestment - renewable energy investment; AccessCleanFT – access to clean fuels and technologies (primarily for cooking); ESDG – environmental SDG score; SSDG – social SDG score; GSDG – governance SDG score; EnviESG – environmental ESG score; SocESG – social ESG score; GovESG – governance ESG score; “\_” indicates interaction terms.

Source: Author’s calculations

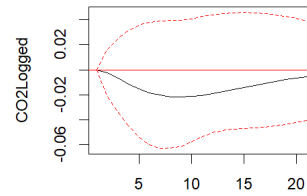
## Appendix 2. IRF plots of CO2 emissions at longer horizon, with and without interactions

Orthogonal Impulse Response from EnviESG



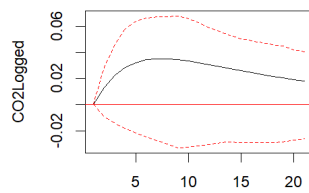
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged



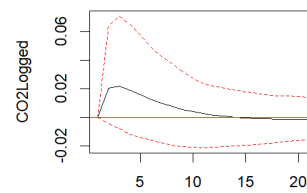
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from LowCarbonTradeLogged



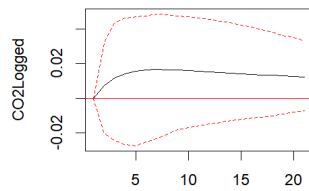
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from FDILogged



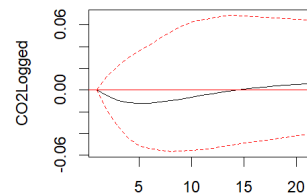
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from PIRenewLogged



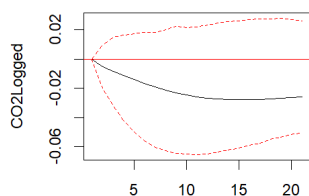
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from REInvestmentLogged



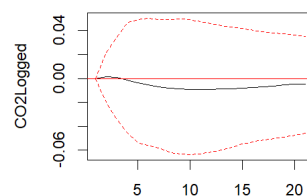
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from AccessCleanFTLogged



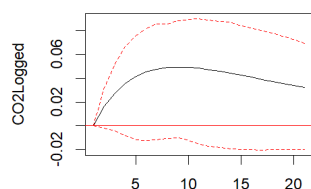
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from BioTradeLogged\_EnviESG



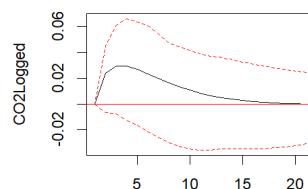
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from LowCarbonTradeLogged\_Enviesg



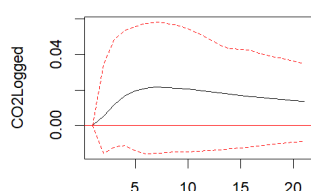
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from FDILogged\_Enviesg



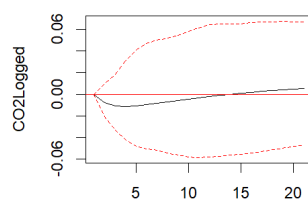
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from PIRenewLogged\_Enviesg



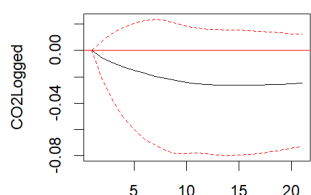
95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from REInvestmentLogged\_Enviesg



95 % Bootstrap CI, 100 runs

Orthogonal Impulse Response from AccessCleanFTLogged\_Enviesg



95 % Bootstrap CI, 100 runs

Note: CO2 – CO2 emissions; Enviesg – environmental ESG score; BioTrade – biodiversity trade; LowCarbonTrade – trade in low-carbon technologies; FDI – foreign direct investment; PIRenew – public investment in renewables; REInvestment - renewable energy investment; AccessCleanFT – access to clean fuels and technologies (primarily for cooking); “\_” indicates interaction terms.

Source: Author’s calculations