



Can Integrate a Sustainable Business Model and Global Value Chains Revive the Value Chain's Sustainable Growth?

Li Yuan¹ · Jukka Mähönen^{1,2}

Received: 27 April 2023 / Accepted: 9 February 2024
© The Author(s) 2024

Abstract

Traditional value chains link factors of production and production to final consumption, adding economic value. To reduce the negative effects of the value chain on the environment and societies, the sustainable business model must be integrated into all parts of the global value chain. This necessitates responsible production and procurement, but all participants must recognise the importance of reusing resources, increasing the product life cycle, and minimising waste. However, this does not imply that all value chain participants in the value chain have equal responsibilities, as they have varying degrees of dominance, interests, and environmental and societal impact in their value chain-related activities. We claim that regional trade agreements are the key to balancing each other's interests in an international value chain, assisting participants in reaching a consensus. On the other hand, existing regional trade agreements have flaws in how they distribute value. Furthermore, their standard-setting does not contribute to developing a sustainable global value chain because it ignores the impact of the sustainable business models of value chain participants on the global value chain. So, the article will focus on reconstructing global value chains by introducing a sustainable business model and using regulatory incentive systems to guide value chain participants in fulfilling corporate social and environmental responsibilities. As a result, this article discusses how a sustainable business model can aid in developing the global value chain in a sustainable direction, as well as how regulation can help.

Keywords Sustainable business model · Global value chain · Regional trade agreements · Information disclosure · Due diligence

Introduction

Before the advent of global value chains (GVCs), the international manufacturing order was relatively independent and complete. The entire product is completed independently within a country, the production boundaries are clear, and the boundaries of the sales are also clear, which are equivalent to the country's geographical boundaries [1]. The external

✉ Li Yuan
li.yuan@helsinki.fi

¹ Faculty of Law, University of Helsinki, Helsinki, Finland

² Faculty of Law, University of Oslo, Oslo, Norway

expansion of enterprises was primarily driven by the two productivity drivers of economies of scale and internalised cost advantages. That is, mass production of homogeneous products and reduction of internal marginal costs¹ to increase productivity and competition. The goal was to achieve a larger proportion of the market share monopoly and close the entire industry chain loop as much as possible [2].

GVCs theory did not enter the international economic arena until the 1980s [3]. This theory disrupted the theoretical tradition of the final product trade [3] and created a fragmented production order [1]. When many multinational corporations discovered that different production links in the same product have different production efficiency and cost advantages in different countries, they increasingly outsourced specific links in the same product to companies worldwide. The division of labour among enterprises in different countries is no longer the traditional division of labour between industries, but rather the division of labour in different production links within the same product [3]. As a result, multinational corporations have risen to the top of the global value chain. Through 'functional integration,' they integrate the most competitive companies from around the world into their own supply chain systems [4], forming a strategic layout that combines 'cost depression' and 'value highland' [5], and opening up a fragmented production order. Since then, it's been difficult to say that a country's production has been completed completely and independently. The production boundary has become muddled and no longer corresponds to the country's regional boundary [1].

With further fragmentation and decentralisation of the global division of labour in the value chain, the proportion of trade in intermediate goods in the trade structure of countries participating in the global value chain has surpassed trade in final products. This changes the impact of trade barriers: it is no longer so much a question of final products as it is of intermediate products, as a greater number of intermediate products face multiple cross-border trade issues as the value chain becomes more complex. Trade costs rise as the complexity of value chains rises due to the superposition of border barriers [6]. The origin of finished goods is becoming increasingly difficult to determine, and more and more multinational manufacturers' production and trade activities in third countries are subject to several domestic trade barriers in the absence of integration. As a result, domestic trade rules limit the competitiveness of both foreign and domestic multinational manufacturers [2].

According to the logic of international value chains, lowering multinational companies' trade costs necessitates lowering economic and trade boundary barriers to final products and intermediate goods.² The requirements of multinational corporations have resulted in an increase in the number of multilateral agreements. Multilateral agreements governed by the World Trade Organization (WTO) rules have played an essential role in providing regulatory guarantees and guidelines for global resource distribution [7]. However, in practice, WTO rules have not produced consistent results. On the contrary, regional economic cooperation dominated by developed economies and their multinational corporations, such as the European Union (EU), has gradually become another way to eliminate barriers to international trade and investment. The multilateral trading system governed by WTO rules has been increasingly marginalised due to the ongoing catalysis of regional trade agreements

¹ The marginal cost is the rise or decrease in the cost of manufacturing one additional product or serving one more client.

² An intermediate good is a product that is used to create a final good or finished product, often known as a consumer good.

[7]. Many regional or bilateral trade and investment treaties have established regional regulations and practice systems, forming standards that exceed WTO standards [8].

Although the paths, goals, and benefits of each country's integration into GVCs differ, more and more countries are participating in them, and their importance in global trade is rapidly increasing. However, today's GVCs are confronted with several threats and challenges. The COVID-19 epidemic has disrupted global trade and exposed the fragility of GVCs in the event of unexpected natural disasters; trade tensions between the world's largest economies and the subsequent war in Ukraine have undermined decades of efforts to promote more open cross-border trade and increased the long-term uncertainty and instability of global value chains; over-exploitation of natural resources, as well as political and economic events in producing countries, have had unpredictable effects on raw material and intermediate goods export supply and prices. These factors are intertwined and superimposed, prompting value chain leading countries and companies to take action to bring their value chains back home.

Under the enormous uncertainty of the current globalisation trend and its tumult, we must begin to reflect on where GVCs will go, whether the framework and structure of GVCs need to be reconstructed in the context of the new era, what role trade agreements play in the process, and what mechanism will be used to reconstruct them for sustainability. GVCs provide a lot of advantages, but we cannot ignore how they affect the environment and society. Global biodiversity, climate change, ecological processes, and human rights are all negatively impacted by GVCs due to the global production of intermediate commodities, end products, and raw materials [9]. For example, statistics show that the production of soybeans, palm oil, beef, and wood products combined account for about 40 per cent to 50 per cent of the total global deforestation [10]. How to change the value chain to reduce its impact on the environment and society is a critical question for our future.

In this article, we demonstrate that regulation incentivising the integration of sustainable business model (SMB) into GVCs is an effective strategy for addressing these issues. Sustainable GVCs offer a double prospect for economic development by reducing the value chain's impact on the environment and making the production, trade, and consumption processes safer and more stable. Environmental characteristics of more sustainable value chains include more efficient use of natural resources, low waste discharge, and low pollution levels. In addition, respect for internationally recognised human rights and interests of indigenous peoples, local communities, women, children, and workers, as well as non-discrimination and non-exploitation, ensuring safe and healthy working conditions, are examples of social characteristics [9]. Therefore, a sustainable global value chain can enhance the security of commodity supply and rebuild mutual trust in global commodity trade, by forming a consensus between the suppliers, traders, buyers, exporting countries and importing countries on the actions and goals of the value chain, and thus filling the current gaps in global governance [11]. At the moment, an increasing number of global value chain participants are pursuing value chain sustainability through responsible commodity production and procurement, as well as circular economy practices, in order to increase product lifespan, reuse materials, minimise waste, and, ultimately, improve environmental quality and human health [9]. This article will discuss how a SBM can aid in developing the GVCs in a sustainable direction, as well as how regulation at both the national policy and national legislative levels can be of assistance.

The article is divided into seven sections, which are as follows: We presented our research background and research purpose in the first section. The second section dissects the concept of GVCs, delving into its phenomenon and theoretical lens. The third section examines the constraints of GVCs and their development trends. The fourth section

explains the definition of SMB and examines the reconstruction of the global value chain by incorporating the SBM into the GVCs. The fifth section discusses the impact of regional trade agreements (RTAs) on GVCs and SBM. The sixth section discusses the regulatory challenges for sustainable GVCs. Finally, the sixth section discusses the conclusion.

Overview of Global Value Chains

GVCs encompass the intricate process of adding value to products throughout various phases, from production to consumption, with contributions from actors located across the globe [12]. This involves the division of production processes among different countries, leading to enterprises specializing in specific tasks rather than the entire product [13]. As a result, GVCs are a dynamic phenomenon where value continually accrues to products through the expertise and resources of participants worldwide, fostering efficiency and specialization in particular aspects of the production process.

As an economic phenomenon, the global value chain is characterised by a highly complex interdependence among numerous nations and regions. Enterprises concentrate on their specific links in the production process, while other production links can be dispersed globally, and the final products are integrated through international trade and cooperation. This mode of labour division and cooperation enables countries to maximise their comparative advantages and achieve more efficient production and allocation of resources. A global value chain may include many links, such as acquisition of primary materials, design, manufacturing, assembly, transportation, and marketing, among others, and connects all links on a global scale.

The rise of this mode of production is a result of technological advancements in communication, transportation, and logistics, as well as the liberalisation of trade policies, which enable companies to allocate production connections globally with greater flexibility. Not only have global value chains altered the pattern of international trade, but they have also profoundly altered the economic structure and development strategies of numerous nations. By participating in the global value chain, developing countries have gained the opportunity to integrate into the global economy and have facilitated industrial upgrading and the transfer of technology [14]. However, there is also an imbalance in global value chains, with certain links concentrated in developed nations and other nations participating in the production chain's lower value-added links.

GVCs are not only an economic phenomenon, but also a theoretical framework for explaining the transformation of production in the globalisation era. This theory's evolution has involved numerous stages and contributors. In the 1970s, Terence Hopkins and Immanuel Wallerstein introduced the concept of commodity chains, which was defined as a set of interconnected chain processes of labour production surrounding final consumable goods [15].

In the 1980s, Porter introduced the method of value chain analysis to the theory of competitive advantage, which disassembled the value creation activities within the enterprise and analysed the enterprise's internal and external competitive advantages. Porter's theory differentiated between a firm's internal value creation activities, emphasizing the interdependence among these activities, and the external perspective of the industry, emphasizing the connection between an enterprise's value chain and the value chains of its suppliers and buyers [16]. In the 1985, Kogut introduced the concept of a 'value-added chain,' emphasizing the vertical division of labour within the value chain [17].

In the 1990s, Gereffi and Korzeniewicz developed the ‘global commodity chains’ theory from Porter’s value chain theory, that explicitly linked the concept of the value-added chain to the global organisation of industries [18]. They emphasised not only the significance of coordination across firm boundaries, but also the increasing significance of new global buyers (primarily retailers and brand marketers) as key actors in the formation of globally dispersed and organizationally fragmented production and distribution networks [19].

By the turn of the twenty-first century, Gereffi had replaced global commodity chains with global value chains when analysing global industrial links and industrial advancements [20]. In the 2011, Gereffi and Fernandez-Stark defined the GVCs as the complete spectrum of activities that firms and workers perform to bring a product from its conception to its final use and beyond, which are performed on a global scale and can be undertaken by multiple firms [21]. In the 2022, Meng and others redefined GVCs concept introduces ‘Trade in Factor Income’ (TiFI), focusing on income generated by foreign direct investment (FDI) and knowledge-based services. GVCs are viewed as a global game of value creation, transfer, and distribution involving firms, countries, and individuals. This perspective recognizes that crossing national borders is no longer a strict requirement for firms to participate in global trade, as FDI and GVCs enable them to export goods and services without physically crossing borders [22]. This redefinition of GVCs highlights the complexity of contemporary international trade and the need for more nuanced measurement methods.

As the theory develops, the theoretical framework of the GVCs becomes increasingly refined, highlighting the importance of value creation and collaboration within and beyond the enterprise, as well as the global industrial supply chain. Diverse theorists have conducted extensive research on the development and impact of global value chains from a variety of theoretical perspectives, giving us the ability to explain phenomena and analyse mechanisms. In addition to explaining the phenomenon, these theories also provide policymakers with recommendations for promoting industrial upgrading, innovation, and sustainable development.

Therefore, GVCs-related international transactions have become an essential aspect of cross-border trade, and GVCs have been recognised as a significant force in the structural transformation of the global economy [23]. In recent years, however, the influence of anti-globalization has hindered the development of GVCs. In the next chapter, we will examine the restraints impacting GVCs as well as their development trends.

Constraints on the Development of Global Value Chains and Development Trend

Constraints on the Development of GVCs

Global value chain expansion momentum has recently slowed, and some industries’ GVCs have shown a relatively obvious contraction trend. To varying degrees, the world’s major industrial and trade countries, including China, the United States, and Germany, have reduced their participation in the global value chain [24]. Although global value chain participation is still increasing, the growth rate has slowed significantly.

According to the United Nations Conference on Trade and Development’s (UNCTAD) calculations, the average growth rate of developed countries’ participation in GVCs reached 11 per cent between 2000 and 2010. From 2010 to 2017, this figure dropped dramatically

to one per cent. During the same period, this indicator's growth rate in developing countries fell from 13 per cent to 3 per cent [25]. The main constraints affecting the development of GVCs are as follows:

Impact of the New Industrial Revolution

Technological innovation under the new industrial revolution is a double-edged sword in the globalisation process. While they help to move goods and services, they also stifle the development of GVCs in some areas. The acceleration of technological iteration reflects the new technological revolution's increasingly active technological innovation, but it also raises the uncertainty of technological investment and its benefits. The intergenerational cycle of new technologies is shortening, and some new technologies have failed to achieve stable industrialisation effects, prompting their next-generation technologies to ramp up research and development. Finally, the impetus for the spread of new technologies in the global value chain is insufficient, impeding the cross-border allocation of innovation elements [24], for example, in the field of communication technology. Some underdeveloped countries and regions have not yet popularised 4G technology. Still, there is fierce competition among the major science and technology countries in 5G research and development, application, technical standards, and infrastructure construction. At this point, 5G commercialisation is far from complete, but technologically advanced countries have begun to develop 6G technology.

Specifically, at the enterprise level, the disruptive innovation of the new industrial revolution will bring a 'niche market'³ to R&D companies, prompting companies with cutting-edge technologies to pay more attention to the internalisation of R&D, so as to minimise the premature results of innovation diffusion, prolonging the profit cycle, and limiting the willingness of leading companies to promote the globalisation of production layout; at the national level, major industrial countries have made significant investments in scientific and technological innovation, which is bound to strengthen intellectual property protection of major R&D and industrialisation results, as well as strictly control cross-border investment and mergers and acquisitions in emerging markets, in order to control high value-added and cutting-edge innovation activities within the country [24]. As a result of the new industrial revolution, disruptive innovation activities are impeding global technology diffusion, which will inevitably limit GVCs' development.

Impact of International Trade Agreement

Economic globalisation has enabled the vast majority of countries (regions) to participate in GVCs, and WTO multilateral economic and trade rules provide rule guarantees and guidelines for global resource allocation. However, due to the anti-globalisation tide, the development of multilateral economic and trade rules is hampered. RTAs have been developed quickly in comparison, and various regional economic and trade rules have been drafted and implemented [7].

The regional trade agreement framework is exclusive and reaching an agreement for countries with disparities in economic levels and political interests is difficult. For example,

³ A niche market is a segment of a larger market that can be defined by its own unique needs, preferences, or identity that makes it different from the market at large. <https://www.shopify.co.uk/blog/niche-markets>. Accessed 04 September 2023.

the Trans-Pacific Partnership Agreement (TPP), also known as ‘giant RTAs’, represents the development needs of countries accounting for 40 per cent of global GDP [26]. Following the withdrawal of the United States from the TTP in 2017, its participating countries re-signed the agreement and renamed it the Comprehensive and Progressive Trans-Pacific Partnership Agreement (CPTPP) [7]. However, this agreement has always excluded China and India, both of which have massive market sizes, from the value chain system. Furthermore, the rules of origin⁴ in regional agreements contain content that restricts GVCs. For example, to prevent treatment discrepancies induced by rules of origin that differentiate items from within and beyond the region, RTAs member industries will be more inclined to purchase raw materials, build factories, hire labour, and so on in the region in order to increase the value of the region and sell them to the region in order to reap regional benefits, resulting in ‘trade diversion’ [7]. When the rules of origin become strict to a certain extent, to enjoy preferential treatment in the region, the industry of the non-member party of RTAs will transfer production lines from the outside region to the region, and ‘investment transfer’ will become a viable option [27]. Regional value chains will eventually replace GVCs.

Impact of Multinational Corporations’ Strategic Adjustment

The COVID-19 epidemic is sweeping the globe, and the global economy has hit. Countries worldwide were deeply troubled by a lack of medical supplies and daily necessities, especially in the early phases of the epidemic. There will be serious consequences for multinational corporations that rely heavily on the global value chain system, such as declining intermediate goods inventories and a lack of alternative channels [24]. In addition, some countries and regions have further reduced their participation in the global value chain due to the severe supply chain security situation.

The occurrence of global supply chain breakpoints has an impact on multinational companies’ supply chain layout strategies. Previously, the layout of global value chains was primarily driven by efficiency factors, with less consideration given to emergencies, natural disasters, or major epidemics that disrupted supply chains. The future layout of the global value chain will be influenced not only by efficiency factors, but also by security factors [28].

Multinational corporations in the global value chain will gradually shift their layout positioning from ‘cost priority’ to ‘strategic priority’. The COVID-19 epidemic has served as an ‘accelerator’ for GVCs. As a result, multinational corporations shift production activities and supply chain links to homes or neighbouring countries that are easier to control. This will be the direction of global value chain adjustment in the post-epidemic period.

Development Trend of GVCs

In a nutshell, the future GVCs reconstruction may exhibit the following trends due to the abovementioned factors.

⁴ The rules of origin are the rules that govern the assignment of a country of origin to a product in order to determine its national source. Their significance stems from the fact that duties and restrictions vary depending on the source of imports in many cases.

First, the GVCs will shrink to a certain extent, showing a localised development trend. The drivers behind the positive expansion of GVCs over the last 20 years can be broadly classified into three categories: falling transportation, communication, and information costs; rapid technological progress; and declining political and economic barriers to trade and investment liberalisation [24]. In recent years, the trade war between China and the United States, as well as the global spread of the COVID-19 epidemic, have caused some countries and regions to recognise that the absence of key links and stages in the industrial chain can result in serious industrial, economic, and even social security problems. While the emphasis has been on efficiency, safety has gradually become an important factor to consider when laying out the global value chain. In other words, due to industrial security concerns, the original global value chain layout may be reduced to some extent; some countries not only have a strong willingness to relocate related industries and product production links back to their homeland but have already begun to implement measures. For example, the 'United States Manufacturing Revitalization Plan' is a policy to encourage American companies to return to their home countries. 'Japan's supply chain reform' is intended to entice industries to return to Japan [28]. 'German Industrial Strategy 2030' proposes consolidating all industrial production links into a single economic region, constructing a complete industrial supply chain, increasing industrial added value, and reducing external shocks and threats [29]. This will undoubtedly accelerate the localisation of the global value chain.

Second, the development of GVCs will become more regional. Technical and institutional factors are extremely important in promoting the evolution of the global value chain's division of labour. Institutional factors are even more important than technical factors in promoting economic globalisation and the evolution of the international division of labour. Economic globalisation's prosperity and development are inextricably linked to the protection of the multilateral trade and investment liberalisation system. However, the current international economic and trade rules and governance system under the WTO framework have been slow to reform and develop [28]. In this context, bilateral and regional trade agreements have become an unavoidable choice and trend, whether it is the intention of some countries to reshape the international economic and trade rules that are beneficial to them outside of the WTO, or the efforts of some countries to continue to promote the development of the international division of labour and cooperation.

During the shrink process of GVCs, the processes and links that were originally divided among different countries and companies will be implemented in one country or several neighbouring countries for production. To deal with the shrinking process, developing various bilateral and regional trade agreements will undoubtedly have a significant impact on the reconstruction of GVCs and the further development of GVCs toward regionalisation [28].

Third, the global value chain's division of labour will exhibit a more diverse development trend. In the post-epidemic era, more emphasis will be placed on the value chain's safety factor, while the efficiency factor will take a back seat, resulting in a 'shrinking' trend in the global value chain. The so-called industrial chain supply chain security issue refers to the risk that if a specific link in the production chain is damaged, the entire production process may be difficult to restart. Although the localisation of the industrial chain (or supply chain) is one option for avoiding this problem, it will result in a loss of efficiency. Especially in terms of the global industrial division of labour, any country or region wishes to have its own supporting production capacity and technical conditions in every important link and stage of each industrial chain; however, even if this is possible (for some

large countries), it is bound to be inefficient and will result in a significant loss of resource allocation efficiency [28].

Making all links and stages of the industrial chain as interchangeable as possible is an important way to ensure the safety and stability of the industrial chain (or supply chain). Even if a supplier discontinues cooperation for any reason, other suppliers can quickly replace it. As a result, in order to address the security risks of the industrial chain (or supply chain) while also maximising efficiency, the GVCs reconstruction will evolve toward a more diverse development trend. These trends provide the way for next chapter discussion on the study and ramifications of reconstruction GVCs, showing the evolving landscape of global economic interactions.

Reconstruction of Global Value Chains

This chapter examines SBM and describes how the value chain can be modified to lessen its environmental and social impact. Moreover, the introduction of SBM into the value chain may result in a new turning point, namely the development of sustainable GVCs.

Definition of a Sustainable Business Model

With the widespread adoption of emerging technologies in recent years, business models have also continued to innovate and drive companies to continuously improve their ability and level of value creation. However, while new business models bring significant economic value to enterprises, they also raise a slew of new environmental and social concerns. As a result, people begin to reconsider the innovation of traditional business model (TBM), gradually shifting to business models based on the concepts of sustainable development and responsible innovation [30]. The SBM is gradually developed based on sustainable development as a company's value proposition and value creation logic, which provide value to the customer, as well as the natural environment and society [31].

A business model is an organisation's approach to creating, delivering, and capturing value. It provides a comprehensive understanding of how a company operates and creates value. The SBM and the TBM are two distinct concepts with distinct connotation characteristics [30]. The SBM aims to implement proactive stakeholder management, seek business solutions that achieve both economic and sustainable development goals, effectively reduce the negative impact of business activities on the environment and society, and improve the business model's social value creation [31]. While the TBM framework is based on a profit model and transaction structure that ignores the enterprise's sustainability elements, bringing the business model into a business field with unlimited economic desires is simple. Therefore, the SBM goes beyond the TBM, emphasising that it actively seeks to incorporate environmental and social responsibility into the enterprise's strategy formulation and business model design, ultimately increasing greater environment and value for multiple stakeholders.

There is a tendency to designate as sustainable any business model that undergoes a transition towards sustainability. Are business models that, for example, employ more resource-efficient production processes sustainable? In fact, the new model is more sustainable than the previous model, but the business model cannot be deemed sustainable [32]. In the following, we introduce the concept of a genuinely SBM and describe the conditions that must be satisfied. According to Searcy, in genuinely SBM, economic, environmental,

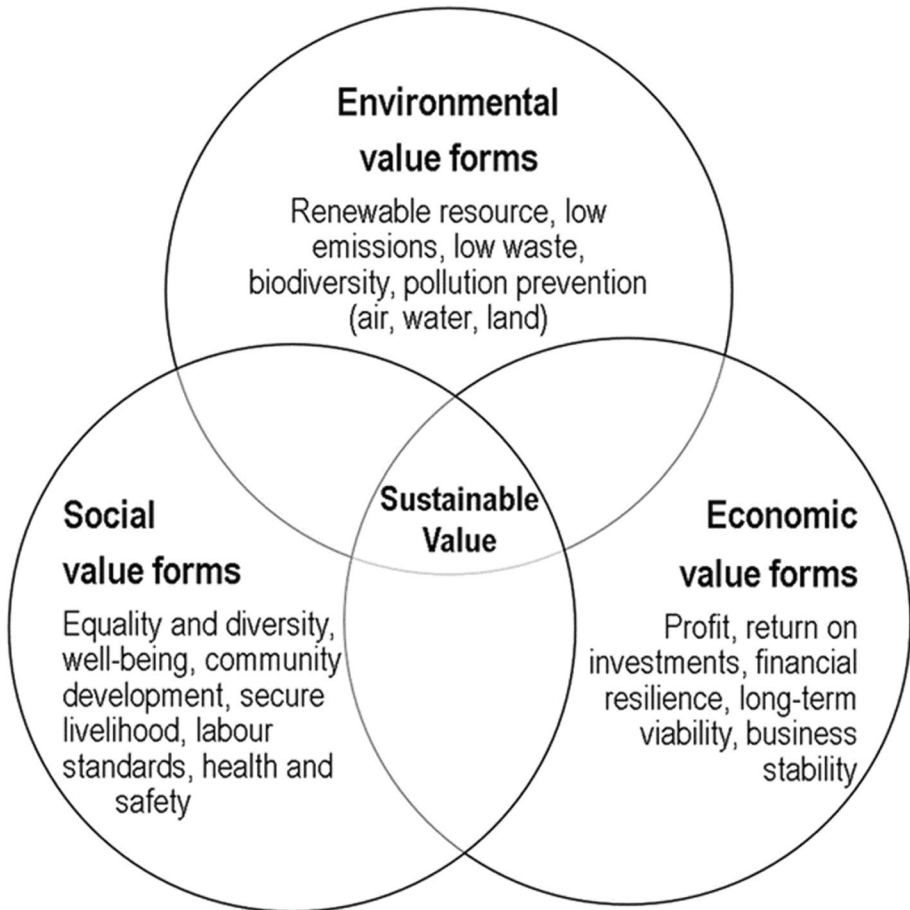


Fig. 1 Illustrates a holistic view of sustainable value integrating economic, environmental, and social value forms [36]

and social factors reinforce one another. Thus, the mere combination of economically, environmentally, and socially focused patterns into a single business model can result in an unsustainable, or business model that does not reach its full sustainability potential [33].

More specifically, the SBM incorporates environmental and social responsibility concepts into capturing, creating, delivering, and distributing value in an enterprise [30]. The SBM focuses not only on creating economic value, but also on creating value for a broader range of stakeholders and taking into account the benefits from a social and environmental standpoint [34]. So, the SBM believes that the enterprise's transaction structure, revenue, and expenditure methods should be designed to meet the 'Triple Bottom Line' (TBL): the bottom line of the economy, the bottom line of society, and the bottom line of the environment. Economic responsibility is the traditional corporate responsibility, which is primarily reflected in increased profits, tax liability, and dividends to shareholders and investors; environmental responsibility is environmental protection; social responsibility is the responsibility to other stakeholders in society [35]. When exercising corporate social responsibility (CSR), enterprises operating under an SBM will fulfil their responsibilities

in the three areas listed above. Businesses must regard environmental and societal interests as values and incorporate sustainable values into the global value chain. The theoretical structure of the 'triple bottom line' is shown in Fig. 1. When a company meets its environmental and social obligations, it can reap the benefits for the environment and society. As a result, the corporate sustainability value is formed by the intersection of the three values.

The scarcity and finiteness of resources are fundamental assumptions of economics. Enterprises must create maximum value with limited resources, which necessitates the management of organisational resource flow through resource management and business model construction. From the standpoint of sustainability, each stage of the product life cycle contains the environmental impact of the flow of resources. SBM entails preserving resources for as long as possible while minimising resource input, waste, emissions, and energy loss or leakage. In this way, SBM will completely alter or reconstruct the product and service life cycle logic [30].

The concept of SBM was originally conceived to allow companies to transition to a more sustainable economic system and provide leverage for integrating sustainability factors into organisations and assisting companies in achieving their sustainability ambitions [37, 38]. However, in today's corporate value chains, the SBM is increasingly seen as a source of competitive advantage [39]. As a result, SBM conceptual models may eventually replace TBM concepts and bring sustainable competitive advantage to the value chain of enterprises.

Roles of a Sustainable Business Model in Global Value Chains

The global value chain system has long exhibited a polarised trend in benefit distribution. Although economic globalisation has fuelled progress and development in both developed and developing countries, the benefits of GVCs participation are not distributed evenly across and within countries. Developed countries take advantage of developing countries' 'comparative advantages', such as low labour costs, weak environmental constraints, and super-national policy treatment, to transfer outdated industries and non-core production links to developing countries, causing developing countries to lose competitiveness in international trade and degradation of the ecological environment. On the other hand, because of the WTO's strict intellectual property protection, developed countries can maintain their monopoly in technical capabilities and standards by frequently applying for new patents. In contrast, developing countries can only engage in labour-intensive manufacturing links. Under the assumption that developing countries cannot access core technologies and technical control standards, their technological innovation capabilities are severely limited, and their profit margins are severely squeezed [40]. So, how can we encourage the development of the global value chain distribution mechanism in a more equitable and reasonable direction? How can the value chain be altered to have a lower environmental and social impact? The introduction of SBM into the GVCs may result in a new turning point, namely sustainable global value chains.

The development of a sustainable global value chain, on the one hand, allows the fruits of economic growth to benefit fields such as environmental protection through the extension of the value chain and, on the other hand, uses the new energy and clean energy industries to directly participate in the initial process of value appreciation [41]. Specifically, enterprises embedded in GVCs from the upstream link rely primarily on advanced elements such as knowledge, technology, and information to participate in global production as suppliers and undertake more high-value-added activities such as R&D design, brand

innovation, and key component supply in GVCs [42, 43]. These links frequently have a strong ability to capture the added value of products, and enterprises can occupy more profit distribution in GVCs by undertaking these links [44, 45]. Suppose the enterprise is embedded in the upstream link and implements a sustainable business model to reshape its competitive advantage in GVCs. In that case, it will be able to achieve a common economic and environmental upgrade [46, 47]. This contributes to the advancement of environmental protection technology among enterprises embedded in upstream links, thereby reducing pollution emissions of enterprises embedded in the upstream links [48].

The following perspectives can help us understand the benefits of introducing SBM to companies upstream in GVCs: First, consider the cost. Enterprises embedded in upstream links can adopt SBM, develop green products and manufacturing processes, and reduce resource and energy consumption in the manufacturing process, lowering costs and ensuring economic benefits while reducing pollution [41]. Second, from the standpoint of the brand. Enterprise upstream link where implementation of SBM can have an impact on eco-branding. The primary method is to provide environmentally friendly intermediate products or services through environmental protection technology upgrades such as eco-design and waste management. International markets with high standards are willing to pay a price premium for these intermediate products or services, creating a unique competitive advantage for the company [49, 50]. Third, in terms of CSR, upstream enterprises have the motivation and ability to take the initiative to undertake the corporate responsibility of reducing pollution emissions, as well as to release positive information on the environment and sustainable development to the international market, in order to establish a good the enterprise's social reputation and to use the benefits of the improved corporate image to offset the cost of emission reduction investment [51, 52].

Enterprises that embed GVCs from downstream links rely on their low-cost advantage to participate in global production as manufacturers and are more involved in low-value-added links such as manufacturing and assembly in GVCs [42, 43]. As a result, these links are frequently associated with the strategic intentions of GVCs leaders, resulting in obvious dependent downstream enterprises in the value chain. GVCs leaders will obstruct and suppress downstream enterprises in the value chain from achieving advanced upgrades to protect their own interests and monopoly position, trapping downstream enterprises in the low-end links of the value chain and impeding downstream enterprises' sustainable development and technological progress [53, 54]. This will be detrimental to the sustainable development of downstream enterprises in the GVCs. However, this will change with the introduction of SBM. Under the sustainable business model, GVCs leaders will provide technical support and technology spillovers to downstream enterprises to ensure the stability and quality of the entire value chain to meet the high standards of environmental protection in the international market [55, 56].

Furthermore, the most important role of introducing an SBM in GVCs is improving manufacturing and consumption resource efficiency, specifically increasing resource utilisation efficiency and recycling rate of key materials, as well as reducing raw material input and waste. It also provides more alternatives in the manufacturing process to solve the substitute materials and substitute energy requirements to produce raw materials and semi-finished products. Disassembled product components, for example, are recycled to become raw materials for future production. Using renewable energy to offset the use of fossil fuels. Recycling and reuse of wastewater, waste heat, and solid waste generated during the manufacturing process in a closed-loop system.

However, the introduction of SBM into GVCs has an impact on a company's earnings structure. For example, SBM requires that the enterprise's procurement and production

activities do not harm the environment or society in such a way that the traditional competitive advantage-based value chain model is broken. That is, the dominant enterprises in the value chain will abandon those high-value-added with environmentally unfriendly partners in favour of those that protect the environment and are socially responsible. This will undoubtedly have an impact on the economic returns of enterprises, and businesses that are socially and environmentally irresponsible will be eliminated.

Impact of Regional Trade Agreements

With the gradual weakening of the globalization trend, the global value chain demonstrates a regionalization trend. As a result, RTAs are becoming increasingly attractive for countries seeking to establish strong economic ties with a region. This chapter examines what RTAs are and why they are essential for balancing the interests of diverse stakeholders in GVCs and fostering consensus among participants. In addition, we will investigate the impact of RTAs on the evolution of SBM.

GVCs are an essential element of international trade development, and RTAs play a crucial role in GVCs. An RTA is a treaty between two or more countries within a particular geographical region. The purpose of these agreements is to facilitate trade between member nations, reduce barriers, and promote economic cooperation [57]. RTAs allow duty-free trade between member countries, or substantially lower import duties [58]. RTAs take many forms, such as Free Trade Agreements (FTAs), Customs Unions, and Economic Integration Agreements. As a result of the recent surge in preferential trade and investment liberalisation, there are currently over 400 regional FTAs in effect [59], covering most of the world's economies. Even the COVID-19 pandemic has not impeded the expansion of FTAs, as demonstrated by the signing of the Regional Comprehensive Economic Partnership (RCEP) agreement on November 15, 2020 [59]. RTAs therefore play a significant role in reshaping the global economic environment landscape.

RTAs are essential to the maintenance of the GVCs' equilibrium of interests. GVCs have spread across the globe because of lower trade costs and the proliferation of vertical specialization. Currently, the final product is viewed as a combination of domestic and non-domestic value contributions. The signing of RTAs brings WTO concessions one step closer, allowing nations to derive greater benefits from international trade and global value chain activities [60]. RTAs reduce the variable and fixed costs of international trade, allowing more value added to be produced within the RTAs and traded on more favourable terms than value added produced externally [61]. Promotes economic growth for all parties by fostering a favourable environment for cross-border business and investment. Moreover, RTAs can assist in fostering consensus among diverse stakeholders. Once a trade agreement has been established between two countries, they negotiate the terms of the agreement, seeking mutually beneficial solutions. The manner in which this consensus is reached is essential for resolving trade disputes and ensuring the efficient operation of value chains. As a result of their effect on global value chains, RTAs fundamentally transform international economic relations [62].

Focus of sustainable economic development has always been how to successfully promote and implement the transformation of SBMs. The economic definition of business model transformation is the continuous process of shifting various resources from unsustainable low-productivity activities to sustainable high-productivity activities, which can occur both within and between firms [63, 64]. How to initiate or hasten this transition is the

most important question for developing and emerging nations. RTAs hinder the development of SBM because they encourage companies to pursue high efficiency while ignoring their environmental and social responsibilities, thereby intensifying the competition for low prices. Some businesses may benefit from preferential treatment in regional markets, whereas others may need to realign their operations to remain competitive.

RTAs are not moving in a direction that is sustainable. Existing RTAs regulations do not incorporate sustainability considerations. Because they disregard the impact of the SBM of value chain participants on GVCs. Therefore, it does not contribute significantly to the creation of SBM. In the subsequent chapters, we will analyse several significant RTAs and discuss the regulatory obstacles they face. Second, existing RTAs are incapable of resolving the problem of profit distribution of sustainable value added, as sustainable value added is the profit generated by the mutual promotion of economic, environmental, and social factors in an SBM. RTAs do not specify the social and environmental responsibilities of value chain participants because they disregard the impact of SBM on GVCs.

Regulatory Challenges for Sustainable Global Value Chains

Although the introduction of SBM into GVCs will provide multinational enterprises with new competitive advantages and sustainable value growth. However, the traditional value chain theory is only an 'economic' theory, with little regard for the environment and social values other than the economic level. As a result, there is a lack of corporate responsibility and due diligence in the GVCs [65]. So, how do we regulate companies that enter the GVCs? Will these regulations be effective, and what challenges will they present? This chapter will examine regulatory corporate responsibility from RTAs and national and transnational legislative perspectives, taking the EU as an example. Also showing a regulatory gap on international level on the first hand and national and transnational, on the other.

Regional Trade Agreements

As regional value chains increasingly replace GVCs, we believe that RTAs are a key regulatory factor in guiding and supervising value chains' sustainable development. Now, RTAs with a relatively broad scope, such as the EU-China Comprehensive Agreement on Investment (CAI), Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and Regional Comprehensive Economic Partnership (RCEP).

The EU-China CAI announced the completion of negotiations at the end of 2020, and it will be China's most ambitious agreement with a third party [66]. CAI refers to the relationship between investment and sustainable development in the form of a declaration in the preamble and proposes high-standard environmental protection goals and the ultimate goal of achieving sustainable development. This ensures that activities under the CAI are in line with the GVCs-friendly investment requirements pursued by both parties [67]. For example, in the 'Investment and Sustainable Development' chapter, the right of the state party to implement environmental measures or laws is recognised, while the duty of the state party not to decrease environmental standards in order to attract foreign investment is established [68]. In addition, CAI increases the importance of environmental protection clauses in regional international economic and trade treaties and, through high-standard environmental rules, has a forcing and demonstration effect on the construction of environmental protection systems in member states and promotes environmental protection and

sustainable development in international trade and economics [67]. However, the agreement has not yet been legally adopted and is still in the debating stage, and its particular application needs to be seen.

CPTPP, the world's highest standard free trade agreement, replaced the Trans-Pacific Partnership Agreement (TPP) on 11th November 2017. Since the United States withdrew from the TPP, the other 11 member countries have signed the new agreement and changed the name to CPTPP. But CPTPP's environmental rules essentially follow the substance of TPP. As the world's highest-level regional trade agreement, the CPTPP has several laws and regulations, including labour concerns, environmental protection, and dispute resolution [67]. In addition to the standard procedural rules, CPTPP includes provisions on CSR, which broadens the scope of the issue of environmental protection [69]. It also requires member nations to establish an environmental cooperation framework to supervise chapter Implementation [70]. For example, Chapter 20 contains clauses that specify the environmental cooperation mechanism, allowing direct involvement in the construction of member states' environmental systems, as well as member states are required to designate relevant agencies or departments as important agency national liaisons within the framework of cooperation. In terms of transparency, CPTPP sets high standards for environmental information disclosure and public participation, from rule implementation to dispute resolution procedures after disagreements arise [67]. So, the agreement's emphasis on environmental cooperation mechanisms and transparency reflects CPTPP's high environmental protection standards.

However, CPTPP's 'Environment' chapter appears exhaustive, but the practical implementation of these environmental protection provisions is difficult to enforce. For example, Article 20.1 primarily focuses on preventing illegal trade in wildlife, but it does not provide clear guidance on implementation. Because it does not address other threats to wildlife, such as habitat destruction or climate change, as well as penalties for violating the provisions may not be severe enough to deter illegal trade. Therefore, due to the unpredictability created by this provision, the CPTPP parties decided to put it on hold [71].

RCEP, the world's largest free trade zone, is opening for business on 1st January 2022. RCEP is a regional economic integration framework led by ASEAN.⁵ In addition to the ten ASEAN nations, the RCEP includes China, Japan, South Korea, Australia, and New Zealand [72]. India pulled out at the last minute. RCEP strengthened the resilience and security of regional industrial networks and supply chains during the epidemic era, considering the demands of all stakeholders to the maximum degree feasible. It has become a significant venue for developing nations to engage in the reconstruction of international economic and trade regulations [73]. RCEP follows the ideas of wide engagement, co-construction, and shared benefits. It is concerned not only with trade and investment fairness, but also with the entire growth and fairness of the Asia-Pacific area, with the primary objective of successfully raising people's living standards [71]. From the agreement's text standpoint, RCEP focuses more on trade barrier reduction, and there is no dedicated chapter to establish environmental measures. Adding appropriate environmental protection provisions will be one of the future components that RCEP must improve.

⁵ ASEAN—Association of Southeast Asian Nations. It is an economic union comprising 10 member states in Southeast Asia, which promotes intergovernmental cooperation and facilitates economic, political, security, military, educational, and sociocultural integration between its members and other countries in Asia. The 10 member states including: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

National Legislation

According to some academics, there is a lack of corporate responsibility due diligence in the GVCs, and the home nation of the corporation should play a more significant role in monitoring [65]. The national legislative practice can be classified into two categories based on the law's various requirements on corporate obligations: regulation through reporting obligations or 'information disclosure'⁶ and a more straight-forward regulation of corporate behaviour 'due diligence'.⁷ Both information disclosure and due diligence legislation embody the cooperative governance concept of multi-party participation and deal with 'irresponsible' business behaviours in the global supply chain through a multi-level governance network [5]. In response to the increasingly negative impact of GVCs on society and the environment, especially the EU and its member states have passed legislation imposing both mandatory information disclosure and due diligence obligations on businesses to promote sustainable economic and social development. We use EU directives as example to discuss how companies in the global value chain are regulated through national legislation and how the two regulatory strategies are used.

The traditional strategy to regulate GVCs is regulation through disclosure obligations. Already in 2014, the EU Accounting Directive [74], the cornerstone of the European information disclosure legislation, was complemented with disclosure duties on due diligence. The 2014 amendments to the Accounting Directive, the Non-Financial Reporting Directive (NFRD) [75] encouraged the corporations with disclosure duties to conduct business in a way that is consistent with social justice and sustainable development while avoiding harmful social and environmental consequences. It required certain companies to disclose non-financial information, including due diligence measures, in their annual reports in order to improve the monitoring, evaluation, and management of the EU CSR performance [76]. Specific regulations require large entities with 500 employees or other entities with significant social and public interests to disclose relevant non-financial information in their annual reports beginning in 2018 on environmental, social and employee affairs, human rights, anti-corruption and bribery. If the company fails to disclose the above non-financial information adequately, a further explanation is required [74].

Due to dissatisfaction to the Non-Financial Reporting Directive's effectiveness to fulfil fully these goals, it was revised in December 2022 with a new Corporate Sustainability Reporting Directive (CSRD) [77]. The new Directive that entered into force on 5th January 2023 modernises and strengthens the rules about social and environmental information as well as due diligence disclosure that companies have to report. A broader set of large companies, as well as listed small and medium-sized enterprises (SMEs), will be required to report on sustainability – approximately 50 000 companies in total. According to the European Commission, 'the new rules will ensure that investors and other stakeholders have access to the information they need to assess investment risks arising from climate change and other sustainability issues. They will also create a culture of transparency about the impact of companies on people and the environment. Finally, reporting costs will be reduced for companies over the medium to long term by harmonising the information to

⁶ Information disclosure legislation is legislation requiring companies to fulfil their social responsibilities by publicly disclosing non-financial information.

⁷ Due diligence legislation requires companies to not only disclose non-financial information, but also to establish due diligence procedures.

be provided' [78]. The first companies will have to apply the new rules for the first time in financial year 2024, for reports published in 2025.

Companies subject to the CSRD will have to report on environmental and social impacts, due diligence and the sustainability risk and opportunities connected to their business model according to more detailed European Sustainability Reporting Standards (ESRS) [77]. The draft standards were developed by EFRAG (previously known as the European Financial Reporting Advisory Group), an independent body gathering various stakeholders. The Commission adopted the first set of standards in the end of July 2023, based on the draft standards published by EFRAG in November 2022 [78]. The Directive also makes it mandatory for companies to have an audit of the sustainability information that they report. In addition, it provides for the digitalisation of sustainability information [77].

As a step forward from indirect disclosure regulation to direct due diligence regulation, the European Commission has also proposed a Corporate Sustainability Due Diligence Directive (CSDDD) [79] as mandatory due diligence legislation. The European Commission formally announced the CSDDD (Proposal) on 23rd February 2022. The proposal is currently being debated between the three legislative institutions of the EU, the Commission, the European Parliament and the European Council. After they approve the legislation, EU member states will have two years to translate the directive into domestic law. According to the Directive proposal, firms have human rights and environmental due diligence requirements for their own activities, affiliates, established business relationships, and value chains. The phrase 'established business relationship' refers to a direct or indirect business relationship with a specific industrial and commercial firm that is long-term or projected to be long-term and represents an integral element of the value chain [78]. The term 'value chains' refers to the activities associated with a firm's production of goods or supply of services, including product creation, usage and disposal, and related activities upstream and downstream that have established commercial links with the company [78]. The European Parliament believes that unified corporate due diligence legislation at the EU level facilitates the global operations of EU enterprises and assists the EU in becoming the global pioneer and standard setter of corporate due diligence legislation [80].

The EU CSRD, which focuses on information disclosure duties, and the European Commission's CSDDD (Proposal), which focuses on due diligence, both of them require firms to adopt social responsibility for their business operations by demanding varying degrees of due diligence. The primary distinction between the two legislative models is represented in the legislative idea and responsibility mechanism. The former uses the market strength of investor decision-making and consumer monitoring to help corporations do ethical business by increasing corporate transparency. The latter is accomplished by increased government action, which requires businesses to implement due diligence processes to prevent, reduce, eliminate, and repair actual or potentially harmful environmental and social consequences [76].

However, there are some gaps remaining even after implementation of the two EU directives, despite them having very strict and detailed regulatory standards for enterprises that embed GVCs. For example, under the NFRD, a bond firm has met its statutory requirements as long as it provides non-financial information in a prescribed format. This has not been changed by the CSRD, and vice versa, as disclosure is regulated by very detailed ESRS. Furthermore, although EU member states can, according to NFRD, ensure that statutory auditors verify that companies disclose non-financial information under the law, these checks only look at the disclosure. They do not evaluate the information disclosed, or the actual impact of due diligence policies [75]. As a result, it is impossible to pursue

enterprises' legal liability for violating the NFRD based on the quality and actual effect of the disclosed content [76]. This flaw shall however be amended with compulsory audit or comparable verification of sustainability reports as required by the CSRD.

The EU and its member states' applicable laws mostly constrain large firms, high-risk medium-sized enterprises, and particularly multinational enterprises. However, albeit the CSRD enlarges sustainability reporting to listed SMEs, the proposed European Commission's CSDDD directly or indirectly excludes the vast majority of SMEs from its scope of application [76]. While exempting SMEs from their due diligence obligations, the legislation mentioned above requires constrained companies to ensure that their suppliers meet the human rights and environmental protection standards stipulated by EU law within a certain range. However, most global supply chain companies are SMEs based in developing countries. Therefore, while considering the interests of EU SMEs, the legislation mentioned above imposes a significant compliance burden on foreign SMEs. Moreover, when these SMEs in developing countries fail to meet EU legal standards, EU-based companies frequently avoid compliance risks by terminating contractual relationships and business transactions, whereas SMEs outside the EU subject to 'sanctions' face difficulties in obtaining effective remedies and appealing opportunities [76].

While these legislative efforts represent important steps towards corporate responsibility in multinational corporations, they have certain limitations. Challenges include enforcing due diligence, particularly across international borders, and imposing compliance costs on SMBs in developing nations.

In conclusion, the connection between RTAs and the national and transnational disclosure and due diligence regimes is tenuous. They rely on different regulatory paradigms, resources, and enforcement mechanisms. While RTAs and national legislation contribute both significantly to addressing regulatory challenges in GVCs, further integration and refinement of these approaches is required to achieve a comprehensive balance between economic, environmental, and social values within global value chains affecting a large number of jurisdictions. Achieving an effective and harmonious collaboration between international and domestic regulatory frameworks remains a difficult but essential objective for sustainable GVCs.

Conclusions

This article examines the research conducted on the revitalization of GVCs as well as the analysis of legal challenges. In response to the question posed by the article's title, it is clear that integrating SBM and GVCs can revitalises the value chain and fosters sustainable growth. Nonetheless, the current regulatory framework, whether at RTAs or in national and transnational legislation, poses obstacles to ensuring that corporate transformations are truly environmentally and socially responsible.

According to the research presented in this article, the recent slowdown in GVC development can be attributed to multiple factors, including the new industrial revolution, changes in international trade rules, and strategic adjustments made by multinational corporations. Regionalization, diversification, and localization are three major trends that have emerged in the reconstruction of the global value chain as a result of these factors. Combining these trends, we have determined that the seamless integration of SBM into GVCs can offer participants competitive advantages and foster sustainable value-added growth. This strategy encourages participants to enhance their environmental and social responsibility

practises, thereby contributing to the development of an environmentally friendly corporate image. We have also examined the significance of RTAs in the context of a globalisation slowdown, as well as their impact on GVCs and SBM. Despite the fact that RTAs can promote economic growth and trade, they impede the transition to a sustainable business model. In addition, ensuring the long-term viability of GVCs presents substantial regulatory challenges. Our analysis reveals that RTAs frequently lack comprehensive regulatory content regarding corporate responsibility, and even agreements with high-quality clauses can be challenging to enforce in practise. Due to the complexity of GVCs, national and transnational legislation, such as EU Directives that provide more precise regulations, can exacerbate disparities in business positions along the value chain.

In conclusion, the research indicates that while integrating SBM and GVCs can revitalises GVCs and promote sustainability, the current regulatory environment is fraught with obstacles. Regional and national regulatory frameworks must be bolstered and expanded to prioritise corporate social responsibility and environmental protection. This strategy can promote the formation and reform of national and transnational legislation in RTAs member states. Further research should concentrate on enhancing corporate social and environmental responsibility provisions in RTAs to promote responsible and sustainable business transformations.

Acknowledgements The authors would like to thank the anonymous reviewers of the Circular Economy and Sustainability Journal for their critical and encouraging comments.

Authors' Contributions The first author developed and wrote the original draft of the manuscript, as well as revising and editing it. The second author enhanced the information in several chapters, checked the manuscript's language content, and assisted with the submission procedure.

Funding Open Access funding provided by University of Helsinki (including Helsinki University Central Hospital).

Data Availability Not applicable.

Declarations

Ethics Approval and Consent to Participate Not applicable.

Consent for Publication All authors provide their consent for publication.

Competing Interests The authors declare no competing interests.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

1. Shi H, Xu L (2021) Rethinking the principle of territoriality of trademark in global value chains - a new observe of OEM trademark infringement (全球价值链中商标权地域性原则的反思——对涉外

- 定牌加工商标侵权的新认识). *Presentday Law Sci (时代法学)* 19:80–87. <https://www.pkulaw.com/qikan/e40b0f5f6773273bfb22f0835b640eadbdfb.html?way=textRightFblx> (In Chinese). Accessed 04 September 2023
2. Liu N (2020) International economic and trade rules in the perspective of global value chain: challenges and trends (全球价值链视角下国际经贸规则面临的挑战与前瞻). *China Bus Market (中国流通经济)* 32:83–89. <https://doi.org/10.14089/j.cnki.cn11-3664/f.2020.12.009> (In Chinese). Accessed 04 September 2023
 3. Liu B (2019) Theory of global value chain: reconstruction of rules and legal evaluation (全球价值链理论: 规则重构与法学评价). *Chin Rev Int Law (国际法研究)* 6:41–59. <http://www.guojifayanjiu.org/Admin/UploadFile/Issue/2b1lm5aa.pdf> (In Chinese). Accessed 04 September 2023
 4. Gereffi G (2005) The global economy: organization, governance, and development. *Handb Econ Sociol* 2:160–182
 5. Li Z (2022a) Legal regulation of multinational corporations' human rights due diligence from the perspective of global supply chain governance (全球供应链治理视角下跨国公司人权尽责的法律规制). *J Hum Rights Law (人权法学)* 1:125–148. <https://www.pkulaw.com/qikan/c84b4e240b67dc5d30e8a16fa651f81abdfb.html?way=listView> (In Chinese). Accessed 04 September 2023
 6. Chen L, Huang P (2019) Modernizing the WTO: global value chains and the multilateral trading system (WTO 现代化改革——全球价值链与多边贸易体系的冲突与协调). *Glob Outlook (国际展望)* 1:16–34. <http://cnki.cqgmy.edu.cn/KCMS/detail/detail.aspx?filename=GJZW201901003&dbcode=CJFQ&dbname=CJFD2019> (In Chinese). Accessed 04 September 2023
 7. Liu Y (2019) Mutual-construction between rules of origin and global value chains in the post-TPP era (后 TPP 时代原产地规则与全球价值链的互构). *J HIT: Soc Sci Ed (哈尔滨工业大学学报: 社会科学版)* 5:27–32. <http://www.cqvip.com/qk/84072x/201905/7002854802.html> (In Chinese). Accessed 04 September 2023
 8. Zhang J (2020) The reconstruction of international trade and investment rules and China's choice under the background of anti-globalization (逆全球化背景下国际贸易投资规则重构与中国的选择). *Strateg Decis Res (战略决策研究)* 4:3–23. https://giis.gdufs.edu.cn/__local/D/1B/33/86D1D61B2E2EF8DCE8EECA182E_FDA00D86_1448DA.pdf (In Chinese). Accessed 04 September 2023
 9. China Council for International Cooperation on Environment and Development (2021) Global green value chain – China's opportunities, challenges and paths under the new situation. <https://cciced.eco/wp-content/uploads/2021/09/4-2-%E5%85%A8%E7%90%83%E7%BB%BF%E8%89%B2%E4%BB%B7%E5%80%BC%E9%93%BE.pdf> (In Chinese). Accessed 04 September 2023
 10. Tropical Forest Alliance (2018) Emerging market consumers and deforestation: risks and opportunities of growing demand. https://www.tropicalforestalliance.org/assets/Uploads/47530_Emerging-markets_consumers_and_deforestation_report_2018.pdf Accessed 04 September 2023
 11. China Council for International Cooperation on Environment and Development (2020) Global green value chain – greening the soft commodity value chain in China. <https://cciced.eco/wp-content/uploads/2020/09/SPS-4-2-%E5%85%A8%E7%90%83%E7%BB%BF%E8%89%B2%E4%BB%B7%E5%80%BC%E9%93%BE-%E4%B8%AD%E5%9B%BD%E8%BD%AF%E6%80%A7%E5%95%86%E5%93%81%E4%BB%B7%E5%80%BC%E9%93%BE%E7%BB%BF%E8%89%B2%E5%8C%96-%E4%B8%AD%E6%96%87.pdf> (In Chinese). Accessed 04 September 2023
 12. China Council for International Cooperation on Environment and Development (2021) Global green value chain – China's opportunities, challenges and paths under the new situation. <https://cciced.eco/wp-content/uploads/2021/09/4-2-Global-Green-Value-Chains.pdf>. Accessed 04 September 2023
 13. The World Bank (2020) World development report 2020: trading for development in the age of global value chains. <https://www.worldbank.org/en/publication/wdr2020>. Accessed 04 September 2023
 14. Gereffi G, Fernandez-Stark K (2016) Global value chain analysis: a primer, 2nd Edition. <https://dukespace.lib.duke.edu/dspace/handle/10161/12488>. Accessed 04 September 2023
 15. Hopkins, T.K. and Wallerstein, I. (1977) Patterns of development of the modern world-system. *Review* 1(2):111–145. <https://www.econbiz.de/Record/patterns-of-development-of-the-modern-world-system-hopkins-terence/10002954155>. Accessed 04 September 2023
 16. Porter ME (1985) Competitive advantage: creating and sustaining superior performance. Free Press, New York, pp 36–53. <https://resource.ist.ir/PortalImageDb/ScientificContent/182225f9-188a-4f24-ad2a-05b1d8944668/Competitive%20Advantage.pdf>. Accessed 22 Feb 2024
 17. Kogut B (1985) Designing global strategies: comparative and competitive value added chains. *Sloan Manage Rev* 26(4):15–28
 18. Gereffi G, Korzeniewicz M (Eds.) (1994) Commodity chains and global capitalism. Bloomsbury Publishing USA

19. Gereffi G (1994) The organization of buyer-driven global commodity chains: How U.S. retailers shape overseas production networks. In: Gereffi G, Korzeniewicz M (eds) *Commodity chains and global capitalism*. Praeger, Westport, pp 95–122
20. Gereffi G, Humphrey J, Sturgeon T (2005) The governance of global value chains. *Rev Int Polit Econ* 12(1):78–104
21. Gereffi G, Fernandez-Stark K (2011) *Global value chain analysis: a primer*. Centre on Globalization, Governance & Competitiveness, Duke University, Durham, North Carolina, USA. https://www.researchgate.net/publication/265892395_Global_Value_Chain_Analysis_A_Primer. Accessed 22 Feb 2024
22. Meng B, Gao Y, Zhang T, Ye J (2022) The US-China relations and the impact of the US-China trade war: global value chains analyses. Institute of Developing Economies, Japan External Trade Organization, Discussion Paper No.851. <https://econpapers.repec.org/paper/jetdpaper/dpaper851.htm>. Accessed 22 Feb 2024
23. Memedovic O, Sturgeon TJ (2011) Mapping global value chains: intermediate goods trade and structural change in the world economy. United Nations Industrial Development Organisation, pp 1–4. <https://www.unido.org/publications/mapping-global-value-chains-intermediate-goods-trade-and-structural-change-world-economy.pdf>. Accessed 22 Feb 2024
24. Yang D, Qu S (2021) Restructuring of the global value chain and adjusting the direction of the international production system under the unprecedented changes in a century (百年未有之大变局下全球价值链重构及国际生产体系调整方向). *Econ Rev J (经济纵横)* 3:61–71. <http://59.252.42.34:6251/Qk/Paper/767084> (In Chinese). Accessed 04 September 2023
25. United Nations Conference on Trade and Development (2018) *World investment report*. https://unctad.org/system/files/official-document/wir2018_overview_ch.pdf. Accessed 04 September 2023
26. Gantz DA (2016) The TPP and RCEP: megatrade agreements for the pacific rim. *Ariz J Int'l Comp L* 33:57. <https://heinonline.org/HOL/Page?handle=hein.journals/ajicl33&id=73&collection=journals&index=>. Accessed 04 September 2023
27. Li L (2011) The impact of rules of origin on international supply chains (论原产地规则对国际供应链的影响). *Int Bus Res (国际商务研究)* 6:30–35. <http://www.cqvip.com/qk/97953x/20116/39889206.html> (In Chinese). Accessed 04 September 2023
28. Dai X, Zhang Y (2021) Global value chain restructuring: challenges, opportunities and strategies for China. *China Economist* 16(5):132–158. <http://www.chinaeconomist.com/pdf/2021/2021-9/Dai%20Xiang.pdf>. Accessed 22 Feb 2024
29. Lu Y (2022) The restructuring of global industrial and supply chains is accelerating; where can Chinese manufacturers break through (全球产业链供应链加速重构; 中国制造业企业破局路在何方)? 21 *Economic Network (21 经济网)*. <http://www.21jingji.com/article/20220530/herald/585c14e3031bd05572834995018d4f5e.html> (In Chinese). Accessed 22 Feb 2024
30. Hongjun X, Zhen Y (2020) Sustainable business model innovation: a review and prospects. *Foreign Econ Manage* 42:3–18. <https://doi.org/10.16538/j.cnki.fem.20200807.101> (In Chinese). Accessed 04 September 2023
31. Geissdoerfer M, Vladimirova D, Evans S (2018) Sustainable business model innovation: A review. *J Clean Prod* 198:401–416. <https://doi.org/10.1016/j.jclepro.2018.06.240>
32. Abdelkafi N, Xu J, Pero M, Ciccullo F, Masi A (2023) Does the combination of sustainable business model patterns lead to truly sustainable business models? Critical analysis of existing frameworks and extensions. *J Bus Econ* 93(4):597–634. <https://doi.org/10.1007/s11573-023-01140-0>
33. Searcy C (2018) Climate change: defining true sustainability. *MIT Sloan Management Review*. <https://sloanreview.mit.edu/article/defining-true-sustainability/>. Accessed 22 Feb 2024
34. Antikainen M, Valkokari K (2016) A Framework for sustainable circular business model innovation. *Technol Innov Manag Rev* 6(7):5–12. <https://doi.org/10.22215/timreview/1000>
35. Gimenez C, Sierra V, Rodon J (2012) Sustainable operations: their impact on the triple bottom line. *Int J Prod Econ* 140:149–159. <https://doi.org/10.1016/j.ijpe.2012.01.035>
36. Evans S, Vladimirova D, Holgado M et al (2017) Business model innovation for sustainability: towards a unified perspective for creation of sustainable business models. *Bus Strateg Environ* 26:597–608. <https://doi.org/10.1002/bse.1939>
37. Rashid A, Asif FMA, Krajnik P, Nicolescu CM (2013) Resource conservative manufacturing: an essential change in business and technology paradigm for sustainable manufacturing. *J Clean Prod* 57:166–177. <https://doi.org/10.1016/j.jclepro.2013.06.012>
38. Stubbs W, Cocklin C (2008) Conceptualizing a “Sustainability Business Model.” *Organ Environ* 21:103–127. <https://doi.org/10.1177/1086026608318042>
39. Nidumolu R, Prahalad CK, Rangaswami MR (2015) Why sustainability is now the key driver of innovation. *IEEE Eng Manage Rev* 43:85–91. <https://doi.org/10.1109/emr.2015.7123233>

40. Qin S (2017) “One Belt, One Road”: a chinese solution for restructuring global value chains (“一带一路”: 重构全球价值链的中国方案). *Int Econ Coop (国际经济合作)* 9:11–16. <http://www.cqvip.com/qk/90392x/20179/673327826.html> (In Chinese). Accessed 04 September 2023
41. Su D (2020) How does the embeddedness of global value chain affect the environmental performance of Chinese enterprises? (全球价值链嵌入如何影响中国企业环境绩效?). *Nankai Econ Stud (南开经济研究)* 5:66–86
42. Koopman R, Powers W, Wang Z, Wei SJ (2010) Give credit where credit is due: tracing value added in global production chains. National Bureau of Economic Research, Working Paper No.16426. https://www.nber.org/system/files/working_papers/w16426/w16426.pdf. Accessed 22 Feb 2024
43. Wang Z, Wei SJ, Zhu K (2013) Quantifying international production sharing at the bilateral and sector levels. National Bureau of Economic Research, Working Paper No.19677. https://www.nber.org/system/files/working_papers/w19677/w19677.pdf. Accessed 22 Feb 2024
44. Gereffi G (2005b) Export-oriented growth and industrial upgrading: lessons from the Mexican apparel case: a case study of global value chain analysis. https://www.soc.duke.edu/~ggere/web/torreon_report_worldbank.pdf. Accessed 04 September 2023
45. De Backer K, Miroudot S (2014) Mapping global value chains. European Central Bank, Working Paper No.1677. <https://papers.ssrn.com/abstract=2436411>. Accessed 22 Feb 2024
46. Lee KH, Kim JW (2011) Integrating suppliers into green product innovation development: an empirical case study in the semiconductor industry. *Bus Strateg Environ* 20:527–538. <https://doi.org/10.1002/bse.714>
47. Marchi VD, Maria ED, Micelli S (2012) Environmental strategies, upgrading and competitive advantage in global value chains. *Bus Strateg Environ* 22:62–72. <https://doi.org/10.1002/bse.1738>
48. Levinson A (2009) Technology, international trade, and pollution from US manufacturing. *Am Econ Rev* 99:2177–2192. <https://doi.org/10.1257/aer.99.5.2177>
49. Orsato RJ (2009) When does it pay to be green? *Sustain Strateg* 3–22. https://doi.org/10.1057/9780230236851_1
50. Albino V, Balice A, Dangelico RM (2009) Environmental strategies and green product development: an overview on sustainability-driven companies. *Bus Strateg Environ* 18:83–96. <https://doi.org/10.1002/bse.638>
51. Hong H, Kubik JD, Scheinkman JA (2012) Financial constraints on corporate goodness. National Bureau of Economic Research, Working Paper No.18476. https://www.nber.org/system/files/working_papers/w18476/w18476.pdf. Accessed 22 Feb 2024
52. Oberndorfer U, Schmidt P, Wagner M, Ziegler A (2013) Does the stock market value the inclusion in a sustainability stock index? An event study analysis for German firms. *J Environ Econ Manag* 66:497–509. <https://doi.org/10.1016/j.jeem.2013.04.005>
53. Humphrey J, Schmitz H (2002) How does insertion in global value chains affect upgrading in industrial clusters? *Reg Stud* 36:1017–1027. <https://doi.org/10.1080/0034340022000022198>
54. Gibbon P, Bair J, Ponte S (2008) Governing global value chains: an introduction. *Econ Soc* 37:315–338. <https://doi.org/10.1080/03085140802172656>
55. Taglioni D, Winkler D (2016) Making global value chains work for development. World Bank Publications - Books, World Bank Group, No. 24426, pp 26–29. <https://econpapers.repec.org/bookchap/wbkwbpubs/24426.htm>. Accessed 22 Feb 2024
56. Fritsch U, Görg H (2015) Outsourcing, importing and innovation: evidence from firm-level data for emerging economies. *Rev Int Econ* 23:687–714. <https://doi.org/10.1111/roie.12187>
57. CFI Team (2022) Regional trading agreements. Corporate Finance Institute. <https://corporatefinanceinstitute.com/resources/economics/regional-trading-agreements/>. Accessed 22 Feb 2024
58. Ishikawa J, Mizoguchi Y, Mukunoki H (2004) Economic integration and rules of origin under international oligopoly. *Int Econ* 55:201–202. <https://doi.org/10.5652/kokusaikeizai.2004.201>
59. Cheng D, Wang J, Xiao Z (2022) Free trade agreements partnership and value chain linkages: evidence from China. *World Econ* 45:2532–2559. <https://doi-org.libproxy.helsinki.fi/https://doi.org/10.1111/twec.13243>
60. Sokolova M V (2016) Trade re(im)balanced: the role of regional trade agreements. Graduate Institute of International and Development Studies, International Economics Department, Working Paper No. IHEIDWP06-2016. https://repository.graduateinstitute.ch/record/295949?_ga=2.122054024.2080077416.1708633288-520102531.1708633288. Accessed 22 Feb 2024
61. Baldwin R (2012) Asian perspectives global issues global supply chains: why they emerged, why they matter, and where they are going. <https://www.asiaglobalinstitute.hku.hk/storage/app/media/pdf/richard-baldwin.pdf>. Accessed 04 September 2023

62. Antràs P, Chor D (2021) Global value chains. National Bureau of Economic Research, Working Paper No. 28549. https://www.nber.org/system/files/working_papers/w28549/w28549.pdf. Accessed 22 Feb 2024
63. Ocampo JA, Rada C, Taylor L (2009) Growth and policy in developing countries: a structuralist approach / José Antonio Ocampo, Codrina Rada, and Lance Taylor; (with contributions from Mariángela Parra). Columbia University Press, New York. <https://doi.org/10.7312/ocam15014>
64. Mcmillan M, Page J, Booth D, Willem Te Velde D (2017) Supporting economic transformation: an approach paper. Overseas Development Institute, London, UK. https://set.odi.org/wp-content/uploads/2017/03/SET-approach-paper-WEB_FINAL_MARCH.pdf. Accessed 04 September 2023
65. Sarfaty GA (2015) Shining light on global supply chains. *Harv Int Law J* 56:419–463
66. European Commission (2020) Key elements of the EU-China comprehensive agreement on investment. https://ec.europa.eu/commission/presscorner/detail/pt/IP_20_2542. Accessed 04 September 2023
67. Zeng W, Liu Y (2022) Comparison and enlightenment of environmental protection clauses between CAI and CPTPP (《中欧全面投资协定》与 CPTPP 环境保护条款的比较及启示). *Int Bus Res (国际商务研究)* 1:98–106. https://ibr.suibe.edu.cn/ch/reader/create_pdf.aspx?file_no=20220109&flag=1&year_id=2022&quarter_id=1 (In Chinese). Accessed 15 April 2023
68. Ma X (2012) A review of environmental clauses in international investment agreements (国际投资协定中的环境条款述评). *Ecol Econ (生态经济)* 7:39–46. <http://www.cqvip.com/qk/96795x/201207/42391304.html> (In Chinese). Accessed 04 September 2023
69. Comprehensive and Progressive Trans-Pacific Partnership Agreement (2016) Article 20.10: corporate social responsibility, and article 20.11: Voluntary mechanisms to enhance environmental. *IILJ PhysicsWeb*. <https://www.iilj.org/wp-content/uploads/2018/03/CPTPP-consolidated.pdf>. Accessed 04 September 2023
70. Comprehensive and Progressive Trans-Pacific Partnership Agreement (2016) Article 20.12: cooperation frameworks. *IILJ PhysicsWeb*. <https://www.iilj.org/wp-content/uploads/2018/03/CPTPP-consolidated.pdf>. Accessed 04 September 2023
71. Ma Z, Xie D (2022) Regional comprehensive economic partnership agreement under the theory of “Building a community with a shared future for mankind” (“构建人类命运共同体”理念下的《区域全面经济伙伴关系协定》). *J SUIBE (上海对外经贸大学学报)* 1:5–19. <https://doi.org/10.16060/j.cnki.issn2095-8072.2022.01.001> (In Chinese)
72. Liu B, Zhen Y, Tu X (2018) New trends and strategic choices of China’s FTA development under the background of anti-globalization (逆全球化背景下中国 FTA 发展新趋势与战略选择). *Intertrade (国际贸易)* 11:10–15. <http://www.cqvip.com/qk/93210x/201811/6100023247.html> (In Chinese). Accessed 04 September 2023
73. Zhu C (2020) RCEP Provides a New Path for the International Economic and Trade Governance System (RCEP为国际经贸治理体系提供新路径). *Economic Information Daily (经济参考报)*. http://www.jjckb.cn/2020-11/27/c_139545896.htm (In Chinese). Accessed 22 Feb 2024
74. Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC, [2013] OJ L 182/19. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013L0034>. Accessed 04 September 2023
75. Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014, amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups, [2014] OJ L 330/1. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095&from=EN>. Accessed 04 September 2023
76. Li Z (2022b) Review of EU and Its Member States’ Corporate Human Rights Due Diligence Legislation (欧盟及其成员国企业人权尽责立法评介). *J Hum Right (人权研究)* 2:47. <https://www.pkulaw.com/qikan/244132212c23f1b96b2286be5a13260fbdfb.html?way=listView> (In Chinese). Accessed 04 September 2023
77. Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, PE/35/2022/REV/1, [2022] OJ L 322/15. <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022L2464&from=EN>. Accessed 04 September 2023
78. European Commission (2023) Corporate sustainability reporting, https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en. Accessed 04 September 2023

79. European Commission, Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937. https://ec.europa.eu/info/sites/default/files/1_1_183885_prop_dir_susta_en.pdf. Accessed 04 September 2023
80. European Parliament resolution of 10 March 2021 with recommendations to the Commission on corporate due diligence and corporate accountability [2020/2129(INL)], T9-0073/2021. https://www.europarl.europa.eu/doceo/document/TA-9-2021-0073_EN.html. Accessed 04 September 2023