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The role of power in cascading sustainability in multi-tier supply chains: a systematic literature review

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ABSTRACT

The increased attention to sustainability compliance of global businesses has led Sustainable Supply Chain Management (SSCM) to become of pivotal importance. Nowadays, consumers are more conscious about sustainability issues and tend to hold large companies accountable for unsustainable and unethical behaviour. Nonetheless, in today's global and fragmented multi-tier supply chains, managing lower-tier suppliers poses critical challenges. This systematic literature review investigates how sustainability initiatives can be diffused in multi-tier supply chains. In particular, the thesis explores the role of power sources and power dynamics in cascading sustainability practices throughout a multi-tier supply chain, an area that remains under-researched in SSCM literature. The reviewed literature is framed around five classifications: (1) supply chain extent; (2) governance mechanisms; (3) types of power; (4) sources and dynamics of power; and (5) active and passive firms. The findings suggest that power plays an important role in sustainability diffusion: indeed, buyer power is crucial to ensure suppliers' sustainability compliance. Among different types of power, coercive power is needed to spread sustainability, but non-coercive power may be more effective in the long term if lower tiers are to be reached. In particular, the role of non-coercive power should be further researched as it is not fully explored in the literature. Moreover, also power dynamics in buyer-supplier relationships can have an impact, depending on whether power sources favour the buyer or the supplier. This work identifies several power sources that can help or hinder sustainability compliance. Power sources that foster the ability of a firm to diffuse sustainability initiatives to lower tiers are almost not present in the literature, hence highlighting another research gap. Power is also found to influence the adoption of different governance mechanisms to manage suppliers. Nonetheless, power and governance mechanisms are mostly studied separately, and their correlation is missing in the papers analysed. Lastly, the exploration of active and passive firms in diffusing sustainability initiatives is a new development from this review, as it has yet to be fully examined in the existing literature. Therefore, this systematic literature review synthetizes the existing literature and represents a novel contribution, as it provides a comprehensive overview of the role of power in cascading sustainability initiatives from different perspectives and identifies the main research gaps related to this topic. Despite the growing trend in research related to power in MT-SSCM, the identified research gaps suggest that there is room for further and more focused exploration of this field.

Keywords

Multi-tier supply chains, Power, Sustainable Supply Chain Management, Sustainability

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Chapter 1

1. Introduction

In recent years, sustainability has become a critical area for global businesses. In 1983, the United Nations established the World Commission on the Environment and Development (WCED), which later defined sustainability in the 1987 Brundtland Report titled "Our Common Future" as "development that meets the needs of the present generation without compromising the ability of future generations to meet their needs" (Report of the World Commission on Environment and Development, 1987). Nowadays, companies are increasingly taking actions to achieve better social, environmental and economic outcomes, driven by societal expectations and business benefits of doing so. Pressures from stakeholders and environmental uncertainty have significantly intensified the focus on sustainability practices within supply chains. According to the "chain liability effect", multinational companies can be held accountable for unethical and unsustainable behaviour of their suppliers, which can damage a firm's reputation and operations (Wilhelm et al., 2016). Although many companies have committed to use suppliers compliant with social and environmental practices, managing sub-suppliers remains challenging and risky. Indeed, lower-tier suppliers are the riskiest members of multi-tier supply chains: suppliers located upstream in the supply chain are less visible and often operate in regions which are less regulated in terms of sustainability standards. Most of the times, multinational companies do not even know who these lower-tier suppliers are nor which sustainability capability they possess (Villena & Gioia, 2020).

The analysis of multi-tier supply chains can help understanding the challenges involved in extending sustainability practices to lower tiers (Grimm et al., 2014; Mena et al., 2013). To ensure sustainability implementation in multi-tier supply chains, a "domino effect" needs to be established. Focal companies require their first-tier suppliers – also referred as direct suppliers – to comply with their sustainability standards, and hopefully they will pass these requirements down in the supply chain (Villena & Gioia, 2020). The goal is to establish a cascading effect, hence diffusing sustainability initiatives from focal companies to the lower and less visible tiers of the supply network.

However, the successful implementation of the cascading effect of sustainability practices is shaped by power dynamics that verify between focal companies, direct and lower-tier suppliers. The asymmetric distribution of power, along with different types and sources of power, all impact the effective spreading of both environmental and social initiatives throughout the supply chain. Nonetheless, while in the literature the area on Sustainable Supply Chain Management is largely researched, the specific role of power in cascading sustainability across supply chain tiers is still underexplored. Thus, there is the need of a deeper analysis on how power can affect the implementation of multi-tier sustainable supply chains, and which dynamics and sources of power are involved in the process.

Hence, this research was conducted with the aim of exploring the correlation between power and sustainability in the context of multi-tier supply chains in the extent literature. This literature review answers the following research question:

RQ. How is power characterised in multi-tier sustainable supply chains?

The thesis is structured as follows. Chapter 1 introduces the research topic. Chapter 2 provides the background: sustainable supply chains and sustainable supply chain management are discussed, and definitions are given. Moreover, the chapter also discuss triggers and pressures to manage lower tier suppliers and provide some examples of companies that have failed to control their supply chains, leading to social and environmental scandals. Chapter 3 details the methodology: this section reviews the process of papers selection and explains how a mixed approach – combining both inductive and deductive methods – was used to extract information from papers analysed. Chapter 4 presents the bibliometric results, providing key metrics on the papers selected. Chapter 5 presents the main results. Finally, Chapter 6 illustrates the conclusions and research gaps. The final output of the literature review are five categories: supply chain complexity, governance mechanisms, types of power, sources and dynamics of power, and finally active and passive firms in cascading sustainability. Each of these categories has been deeply analysed, and evidence that could help their understanding were found in the selected papers. Data extracted from the papers was then organized either by applying existing frameworks in the literature, or by creating new codes based on information found.

Deeping the knowledge on dynamics of power in supply chains is pivotal to understand how sustainability requirements can be effectively cascaded to lower-tier suppliers, therefore ensuring more visibility on today's complex and fragmented supply chains.

Chapter 2

2. Background

2.1. Introduction to Sustainable Supply Chain Management

As the concern on environmental and social issues is rapidly growing, sustainability of supply chains is on the spotlight. A definition of supply chain given by Mentzer et al. (2001) is "a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer". Indeed, a supply chain can be defined as a network made by individuals and companies involved in creating and delivering a product or a service to final consumers (Hayes, 2024). In fact, it can be said that the supply chain encompasses all the activities which are involved in the transformation of goods from raw material extraction to final consumer, including information flow. As supply chains serve the scope to deliver services and goods around the word, they can be considered the engine of today's global economy. Notably, they are of critical importance in our society and economy, and thus they use a lot of resources (*Apply Sustainable Practices throughout the Supply Chain*, n.d.). For this reason, supply chains are a potential source of several environmental and social issues. Given that sustainability issues are receiving attention among businesses, sustainability in supply chains has become a key target to reach and it is increasingly recognized as a key component of corporate sustainability (*Apply Sustainable Practices throughout the Supply Chain*, n.d.). Companies have started to consider the environmental and social impact of their products and services, from the beginning to the end of their life cycle. In this context, corporate sustainability is defined as a company's delivery of long-term value creation in financial, social, environmental and ethical terms.

A supply chain is green or sustainable when it integrates ethical and environmental responsible practices. Linton et al. (2007) define a supply chain as sustainable when it includes social and environmental dimensions as well as profits and loss measures. For a supply chain to be sustainable, social and environmental initiatives must be present in all phases involved, from raw material sourcing to transportation to end consumer, including also the recycling process (Figure 1). The objective of supply chain sustainability is to

create long-term environmental, social and economic value for all stakeholders involved in bringing products and services to market. The increased interest on sustainability of supply chains is also caused by the fact that consumers' interest on brands' sustainability is growing exponentially, and there are severe risks for companies ignoring these concerns. Thus, the efforts toward "greener" and socially sustainable supply chains are growing both in academic and business context.

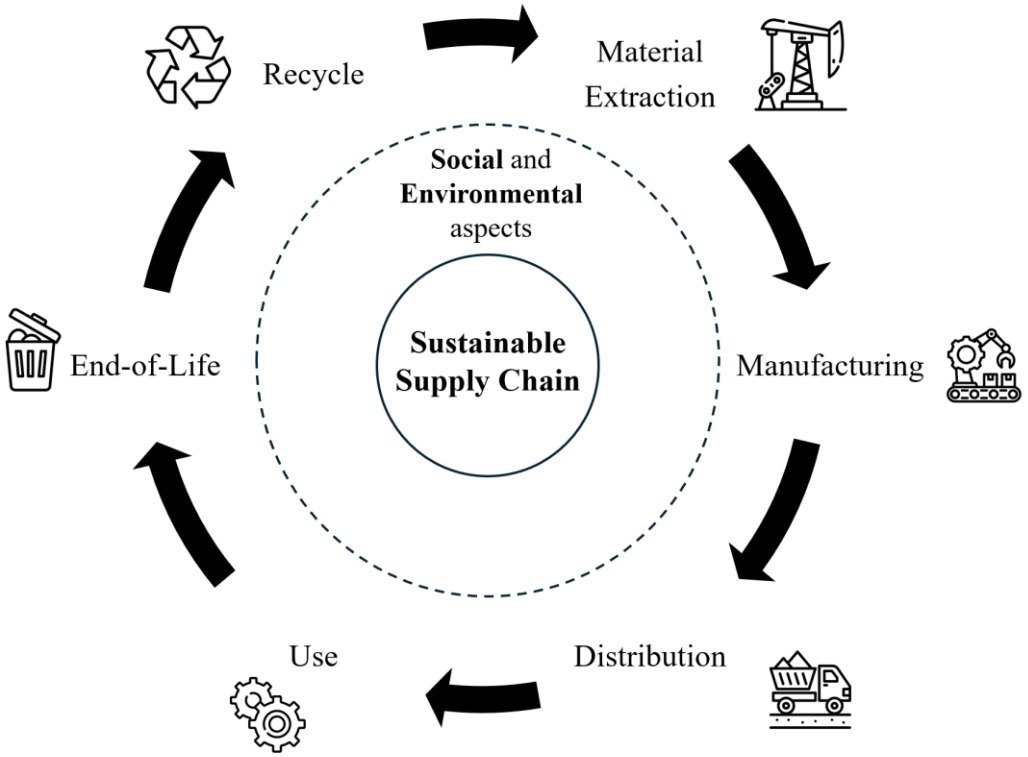

Figure 1. Sustainable supply chain

As ethical and environmental supply chain practices gain prominence as a critical and strategic priority for businesses, also the standardization of compliance objectives and sustainability benchmarks is becoming more common. The United Nations Global Compact – the world's largest corporate sustainability initiative – has outlined ten key principles for evaluating supply chain sustainability (United Nations Global Compact, 2015), which are listed in Table 1. These principles are grouped in four areas (human rights, labour, environment, anti-corruption) and are grounded in the recognition that socially responsible practices and products contribute not only to the welfare of

individuals and the environment but also to the enhancement of brand reputation, competitive advantage, and long-term financial viability of businesses. In fact, companies can use the United Nations Global Compact principles as the basis to work toward sustainability. By incorporating the United Nation Global Compact's Ten Principles into their supply chain management, companies can enhance corporate sustainability and support broader sustainable development goals.

Table 1. UN Global Compact's Ten Principles (United Nations Global Compact, 2015)

Human rights	**Principle 1**	Businesses should support and respect the protection of internationally proclaimed human rights; and
	Principle 2	make sure that they are not complicit in human rights abuses.
Labour	**Principle 3**	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
	Principle 4	the elimination of all forms of forced and compulsory labour;
	Principle 5	the effective abolition of child labour; and
	Principle 6	the elimination of discrimination in respect of employment and occupation.
Environment	**Principle 7**	Businesses should support a precautionary approach to environmental challenges;
	Principle 8	undertake initiatives to promote greater environmental responsibility; and
	Principle 9	encourage the development and diffusion of environmentally friendly technologies.
Anti-corruption	**Principle 10**	Businesses should work against corruption in all its forms, including extortion and bribery.

As regard human rights, the main responsibility is not to infringe the right of others. Relating to this, The Guiding Principles on Business and Human Rights (the Guiding Principles), endorsed by the UN Human Rights Council (*Welcome to the Human Rights Council*, n.d.) in June 2011, provide a globally authoritative standard for how companies can meet this responsibility. These principles recommend that businesses implement policies and processes suited to their size and situation, including a continuous human rights due diligence process, to "know and demonstrate their commitment to respecting human rights". It has to be highlighted that the Guiding Principles include also human rights for workers. Human rights of workers are also mentioned in the principles that constitute labour section. Businesses should promote the realization of human rights through social investments, public policy engagement and philanthropy, but also through business activities. Moreover, within their supply chains, organizations should also respect international labour standards to prevent serious issues such as child and forced labour. Companies should ensure the rights of all people to work in safe and healthy conditions, banning unsafe and hazardous work. More importantly, business should ensure that they do not contribute, through their business relationships, to the violation of these rights and that such infringements are not directly linked to their services or products. On the environmental topic, it is to be noted that the environmental impact of supply chains is non negligible, as it was previously mentioned. The most common impacts include large energy use and high greenhouse gas emissions, but also water pollution, deforestation, toxic waste and loss of biodiversity are to be highlighted. Collaboration with suppliers involved in the supply chain is essential for companies to engage in greater environmental responsibility. Finally, corruption risks in supply chains include procurement fraud and corrupt practices by third parties. When companies include anti-corruption programmes in their supply chains, they can both improve product quality and reduce fraud while also strengthening their position and reputation as honest businesses.

In this scenario, Sustainable Supply Chain Management (SSCM) has emerged as a key field to effectively achieve sustainability outcomes. SSCM has several definitions in the extent literature. The most authoritative definitions are given by Seuring & Müller (2008) and Carter & Rogers (2008). Seuring & Müller (2008) define sustainable supply chain management as "the management of material, information and capital flows as well as

cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements". Carter & Rogers (2008) SSCM definition is instead based on the concept of triple bottom line: the authors define SSCM as "the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key interorganizational business processes for improving the long-term economic performance of the individual company and its supply chains". Both definitions embed the triple bottom line (TBL) framework developed by Elkington, within supply chain management. According to the TBL, sustainability consists of three elements: the environment, the society and economic performance as it is shown in Figure 2. By maximising all these three aspects, organizations can have a positive impact on the word while preserving financial performance.

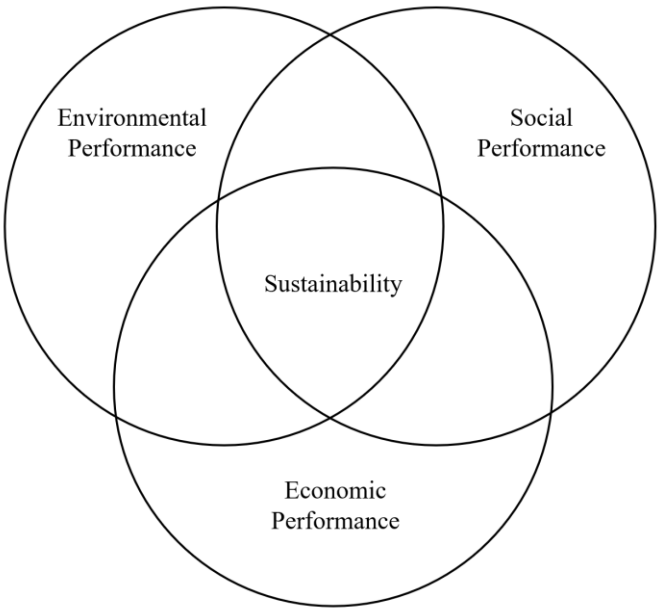

Figure 2. Triple bottom line framework developed by Elkington (Adapted from Carter & Rogers, 2008)

SSCM research's interest has been significantly growing in the past few years. Brandenburg et al. (2019) affirm that research topics "sustainability" and "sustainable

supply chain" emerged in the 1990s but gained popularity in the early 2000s, with a constantly increasing number of academics and practitioners exploring the field.

2.2 Multi-tier supply chains

In today's global business landscape, supply chains are increasingly difficult to be controlled and managed. This is mainly due to the two phenomena of globalization and outsourcing. In particular, the spreading of globalization – which increases interdependence among countries through the exchange of goods and services – has made supply chains more fragmented and complex. For this reason, nowadays supply chains are mostly global and production processes are dispersed around numerous countries. Koberg & Longoni (2019) define a global supply chain as a supply chain that extends beyond a single country. More specifically, global supply chains are characterised by the leadership of focal companies which operate across multiple countries, establish production facilities abroad and source materials from suppliers located overseas. Global supply chains are typically managed by focal companies. According to Seuring & Müller (2008), focal companies are those company that: (1) rule or govern the supply chain, (2) provide direct contact with the customer and (3) design the product or service offered. Global supply chains, with their dispersed production processes, involve multiple tiers composed by different actors. To be more precise, a multi-tier supply chain is a complex network made by a focal company and multiple suppliers located in different areas. In this case, the focal company manages relationships with numerous suppliers in different locations, and multiple steps are involved from raw material to use phase.

According to Sauer & Seuring (2018) it is particularly challenging to manage multi-tier supply chains and to align them with the TBL, as the majority of sustainability impacts happen at raw material stage – upstream in the supply chain – and also due to the fact that there is a large number of distant tiers to control. In recent years, the research focused on the sustainability of sub-suppliers in multi-tier supply chain has substituted the one focused on the management of sustainability at a direct supplier level (Jamalnia et al., 2023). Sub-suppliers are defined as suppliers' suppliers and are located upstream in the

supply chain, or in the “n” tier. Intuitively, the lower the tier, the more difficult it is for the focal company to have visibility (Figure 3).

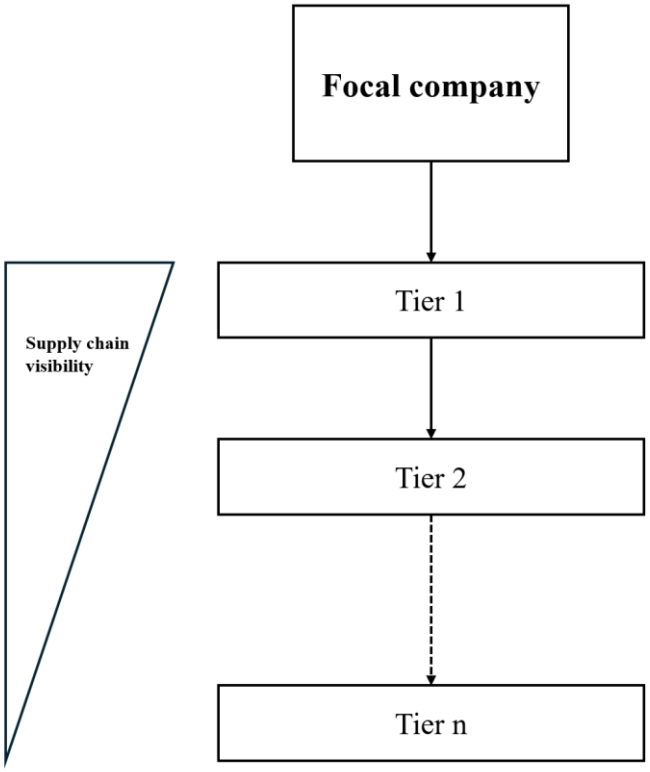

Figure 3. Structure of a multi-tier supply chain

Multi-tier Sustainable Supply Chain Management (MT-SSCM) explores the practices to successfully achieve sub-suppliers’ compliance with sustainability. Compared to SSCM, MT-SSCM focuses on firms’ relationship beyond the dyad buyer-direct supplier, considering also lower-tier suppliers. Moreover, Ashby et al. (2012) point out that in SSCM environmental dimension is more prominent than social dimension, and thus social aspects are often neglected. This, in particular, is a limitation of SSCM, while MT-SSCM research is expanding its focus to encompass all three dimensions of sustainability (Sauer & Seuring, 2018). MT-SSCM is of particular importance for companies, as lower-tier suppliers are the riskiest members of the supply chain. Indeed, they possess characteristics that make it difficult to manage them. Nonetheless, lower-tier suppliers can no longer be excluded from sustainability management, as focal firms are increasingly held accountable for social and environmental scandals that may involve their supply chain

and their lower-tier suppliers (Hartmann & Moeller, 2014). This phenomenon will be explored in Section 2.3.

2.3. Triggers for Sustainable Supply Chain Management

In general, pressure to increase visibility in the supply chain can be exerted by numerous stakeholders, that constitute the "triggers" for the adoption of Sustainable Supply Chain Management. These triggers are variables that motivate focal companies to incorporate sustainability practices in their supply chains. Among the stakeholders who can put pressure on the focal company to exert control over its suppliers, Gemente et al. (2024) include non-governmental organizations (NGOs), final costumers, governments and media, as shown in Figure 4.

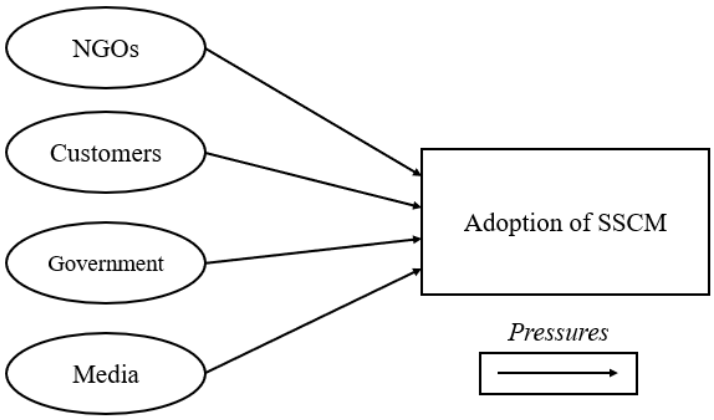

Figure 4. Triggers for SSCM

NGOs are non-profit organizations dedicated to work for public good, addressing social, environmental and political issues. These organizations apply pressure on focal companies by monitoring irregularities that may occur in their supply chain (Gemente et al., 2024). Customers may impose pressures on focal companies, as social and environmental issues directly impact them as consumers, and play a crucial role as they may boycott a focal company's business for its irregularities in the supply chain. In recent years, the consciousness of consumers toward sustainability has increased substantially,

encompassing both social and environmental concerns. Consumers are concerned not only with environmental impact of organizations but also with their social responsibilities, demanding transparency and accountability in their operations. Regarding this, Hartmann & Moeller (2014) introduce the concept of "chain liability". According to the authors, consumers tend not to distinguish between members of the supply chain when it comes to unsustainable behaviour, but instead they hold focal companies accountable for actions of lower tiers of their supply chain. The risk for focal companies is high: consumers' activism can lead to boycotts against focal firms that are associated with environmental or social incidents, even if the root cause is in their upstream network and lower-tier suppliers are mostly responsible. Moreover, governments, which are the authorities responsible for legislation and for ensuring compliance with existing laws, can be a source of pressure for focal companies. According to Seuring & Müller (2008), governmental controls include regulations and legal requirements from local, national and international authorities. As previously mentioned, if sustainability issues are not addressed there is a strong reputational risk, which can increase with the work of media. Media can expose and disclose to the public any misconduct of focal companies, thus influencing society's perceptions. In general, the potential loss of reputation can push companies to adopt sustainability practices, but the compliance with sustainability requirements and the adoption of sustainability practices are also sources of competitive advantage (Seuring & Müller, 2008).

2.4 Environmental and social scandals in multi-tier supply chains

In this section, examples of recent social and environmental scandals involving large multinational companies and their complex supply chains will be discussed. Social scandals discussed are linked to abuse of workers' rights and poor working conditions, while environmental scandals are primarily related to deforestation.

2.4.1 Social scandals

The industry with the most numerous and severe social scandals verified in multi-tier and global supply chains is the fashion industry, and in particular fast fashion. The fragmented

apparel supply chains are often characterised by poor working conditions and forced or child labour.

One of the most famous social scandals involved Nike (Verbeke & Ian Lee, 2021), the largest athletic shoe company in the world, in the 1990s. Nike was accused by labour and human rights activists of using sweatshops and child labour in Indonesia, Vietnam and China. Indeed, in 1991 an NGO – the Asian-American Free Labor Institute (AAFLI) – published a report on working conditions at Indonesian factories. The report was based on the research of Jeff Ballinger, a labour activist who brought to light the labour conditions of Nike's subcontractors. Nike contractors were found to hire children in Indonesia, and it emerged that they paid their workers less than US $1 a day. In 1992, Nike's image and brand reputation started to be severely impacted by the revelations about the working conditions in its factories in Indonesia. Media started to be involved, worsening Nike's position. In 1993, a CBS report revealed the poor working conditions and extremely low wage affecting Indonesian workers at Nike contractors' factory. Later on, also other Nike's subcontractors based in different countries came under the spotlight. In 1996, Life magazine accused Nike of exploiting child labour in Pakistan. Moreover, in the same year, CBS News revealed low wages, physical abuse of workers and sexual harassment of female employees in Nike's shoe factories in Vietnam. As a result of the negative media attention, Nike became strongly associated to worker's exploitation. Moreover, due to its damaged image, Nike experienced a decline in sales and stock prices. During these years, end consumers also started boycotting the company after it was linked to sweatshops, and protested against the company (Figure 5).

Figure 5. Protests against Nike's sweatshops (Lutz, 2015)

In this context, Nike tried to rebuild its credibility: in 1998, it increased minimum age for new hires, and it joined the Fair Labor Association, a non-profit organization to monitor working conditions in factories (Verbeke & Ian Lee, 2021). In 2001, Nike published its first Corporate Responsibility Report, with a section dedicated to its labour practices to monitor child labour (Verbeke & Ian Lee, 2021). In 2004, the second Corporate Responsibility Report provided deeper details: indeed, it contained the description of the monitoring process to assess a factory's compliance. It was clear to Nike that the relationships with subcontractors was key to have visibility in its supply chain (Verbeke & Ian Lee, 2021). Still nowadays, Nike faces pressures from the public. Although the perception of Nike as a work exploiter has changed, the firm continues to face challenges on Corporate Social Responsibility. Still today, despite Nike's progress in addressing sustainability, the company continues to receive criticisms regarding labour rights, highlighting the need for further improvements.

Following the Nike scandal in the 1990s, the 2013 Rana Plaza collapse in Bangladesh further unveiled the risks of poor working conditions in multi-tier supply chains. In April 2013, Rana Plaza factory went through a structural failure and collapsed (Jones, 2020). The building, located on the outskirts of Dhaka – the capital city of Bangladesh – contained many clothing factories. The building was eight stories high, and housed five garment factories, a bank and apartments. The fifth to eight floors were added without

proper supporting walls, and the weight of the heavy machinery from the garment factories exceeded what the structure could handle. Indeed, the building was designed for shops, and it was not suited for the weight and constant vibrations of factory machinery. The factory was reported to have cracks in its walls, and there were multiple warnings about its unsafe condition, yet employees were still pressured to work there. On April 23 cracks in the building were noticed, leading to a warning for workers to stay away. Nonetheless, the garment factories' owners claimed that it was safe to work in the building and forced the workers to return to work. The following day, the building collapsed with more than 3000 people inside (Figure 6).

The incident killed 1134 people and injured more than two thousand. The Rana Plaza collapse highlighted the terrible working conditions under which clothing is produced: despite the fact that responsibility was mostly attributed to Sohel Rana, owner of the building, retailers were also held accountable for failing to oversee their suppliers' capacity, safety standards and wage conditions. Indeed, workers at the garment factory manufactured items for major retailers, such as Benetton, Mango, Walmart and Zara.

Figure 6. Rana Plaza collapse (Jones, 2020)

Rana Plaza was one of the many buildings in Bangladesh repurposed into a factory, and its collapse became one of the worst industrial disasters in history, generating protests all

around the word, as well as global scrutiny. Amnesty International defined it as "the most shocking recent example of business-related human rights abuse" (Westby, 2024). The disaster highlighted deep and severe inequalities: workers endured long hours in unsafe conditions, earning about $50 a month. Following the collapse, companies supplying from these factories faced criticism and customers' protests for failing to ensure safe working conditions in their supply chain.

More recently, LVMH's Christian Dior brand has been under the spotlight for unethical supply chain issues (Parodi, 2024). Investigations found that two of its Chinese-owned subcontractors based in Italy had exploited their workers. Indeed, workers were subjected to long hours, working often at night and during holidays. Some of the staff also slept at their workplace, and some were irregular immigrants in Italy with no proper work contracts. Even though the court's investigation did not found Dior criminally liable, it was deemed negligent for not talking "appropriate measures to check actual working conditions or technical capabilities of contracting companies." A similar accusation was moved toward the brand Giorgio Armani, which was said to fail in overseeing its suppliers, as human rights violations were found in its supply chain (Danziger, 2024). Unethical practices in the luxury industry can severely damage the brand image, but they can also undermine the fashion industry as a whole: these events are not only unethical, but they could cause customers to lose trust in luxury brands as providers of high-quality products, leading to economic damage.

2.4.2 Environmental scandals

Irresponsible businesses are driving the destruction of tropical forests (Figure 7), together with the communities and biodiversity that rely on them. Indeed, although tropical forests cover just 6% of the planet's land surface, they are very rich in terms of biodiversity. Tropical forests, such as those in the Amazon, Congo Basin, and Papua Nuova Guinea, are crucial to prevent climate change (*Tropical Rainforests*, n.d.).

*Figure 7. Aerial shot showing deforestation in Amazon rainforest in Acre, Brazil (*Halting Deforestation and Conversion through Finance: Central Bank of Brazil*, 2024)*

Since these forests play a pivotal role in the global water cycle by absorbing carbon dioxide, preserving them can be crucial to provide CO_2 reductions needed to limit global warming to 1.5°C (*Why Do Forests Matter?*, n.d.). Moreover, these forests provide livelihood to indigenous people and forest communities. Yet, according to the UN Food and Agriculture Organization (*Deforestation: Causes and How the EU Is Tackling It*, n.d.), 420 million hectares of forest were lost due to deforestation between 1990 and 2020. Forest destruction often coincides with human rights abuses against communities that have protected this land for generations. The phenomenon of deforestation is often driven by the interests of companies or their suppliers, seeking to expand agricultural land. This is especially true for the food industry. Indeed, many fast-food giants and supermarket chains were involved in environmental scandals linked to deforestation.

UK meat industry and the supermarkets it supplies were recently on the spotlight. The investigation of the environmental group Mighty Earth brought out a direct link between illegal deforestation in the Amazon and supplies of soya beans imported in the UK from Brazil by US commodities giant Cargill (Hoskins & Pat, 2023). The explosion of global

soy production has a severe environmental impact, leading to the release of extra tonnes of CO_2 emissions. In particular, Cargill directly supplies Avara Foods, the UK's largest chicken producer. Avara supplies several well-known supermarkets – including Tesco, Lidl and Sainsbury's – but also fast-food chains like KFC and McDonald's (Clarke, 2023).

A similar accusation was moved by Earthsight to other European supermarkets and fast-food chains, also involved in business activities with Cargill. According to Earthsight's investigations (Figure 8), chicken products sold by McDonald's and leading European supermarkets are involved in illegal deforestation in Brazil and right abuses of indigenous people (Earthsight, 2022). These European chickens are raised on feed that contains soy exported to the EU by soy traders Bunge and Cargill.

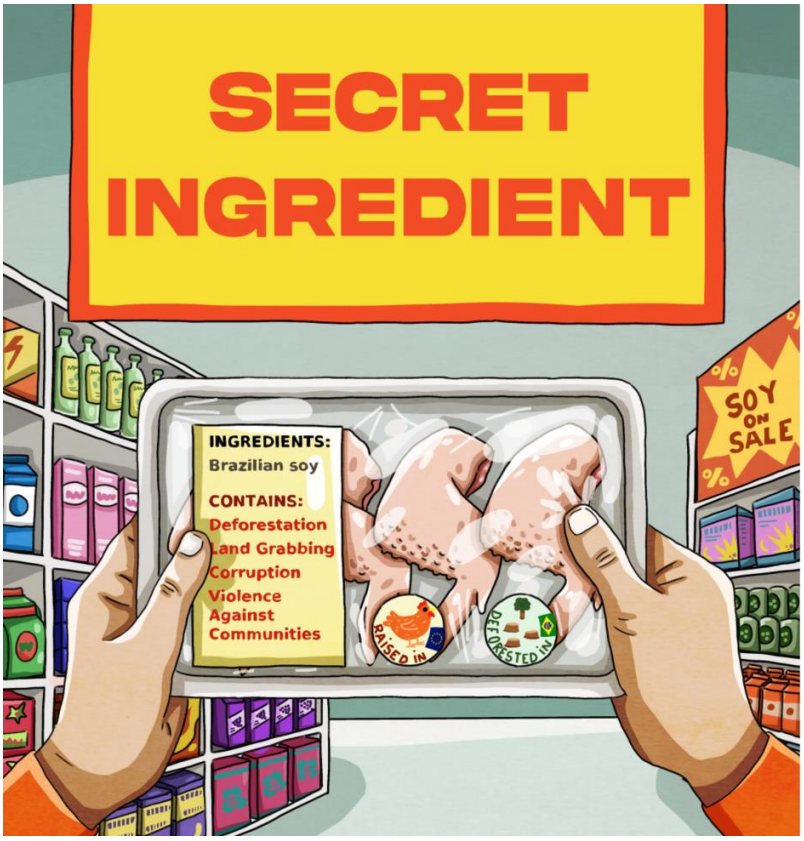

Figure 8. Cover of Earthsigth's Report (Earthsight, 2022)

These major agricultural trading companies are sourcing soy from Brazilian firms involved in deforestation of the Cerrado, an important carbon sink and biodiversity

hotspot located next to the Amazon, while also violating local communities' rights. The Cerrado is a rich biome which has lost half of its vegetation to agribusiness. Thus, the soy under consideration enters the supply chain of fast-food giant McDonald's, together with large supermarket chain Carrefour, Intermarchè, Edeka and Albert Heijn. The investigation shows a clear failure of companies in tracking their supply chains and in reaching visibility on lower tiers, as well as the urgent need for proper legislation in consumer countries. The two implicated soy producers were also certified by the Round Table on Responsible Soy (RTRS), which has suspended their certification in response of the accusations.

These recent accusations are not unprecedented, as Greenpeace raised similar concerns some years ago. In 2019, Greenpeace accused major fast-food chains of being involved in deforestation, as their products were said to fuel forest destruction (Abelvik-Lawson, 2019). Indeed, it seems that KFC's chickens were fed a diet based on soya direct from the forests of Brazil. This supports a powerful system that sustains the expansion of agribusinesses into the Amazon Forest. Fires were said to be set intentionally by farmers to clear land, encouraged by President Bolsonaro's policies to open the Amazon to agriculture. In this context, the decisions of large fast foods could have an impact in stopping deforestation: if these food companies took a strong position against forest destruction and address their role in deforestation, the entire industry could follow. Greenpeace accused also Tesco and Sainsbury, UK's biggest supermarkets, of commercialize industrial meat that fuels deforestation. Moreover, the environmental investigations conducted by Eartsight claim that these UK supermarkets chains, together with KFC, are not only contributing to deforestation but are also buying chicken fed on soya from Brazilian farms located in areas where indigenous people were evicted from in the 1950s (Dalton, 2022).

When examining environmental issues derived from a lack of visibility on supply chains, also palm oil production must be mentioned, as it largely contributes to environmental degradation. Despite the efforts, multinational companies still have not been able to eliminate deforestation from palm oil production. Palm oil is found in several products, from shampoos to chocolate. Despite being a product used across the world, its production happens only in a few countries across Africa, South America and Southeast Asia (Ritchie, 2021).

In recent years, demand for vegetable oils has raised considerably. Palm oil has taken up a lot of this production – especially in Malaysia and Indonesia which account for 80% of palm oil production – with negative effects for the environment. Indeed, between 1970 and 2020 the world's production of palm oil increased by about 40 times (Ritchie, 2021). It is to be noted that also other vegetable oils are contributors to environmental harms, but palm oil is so popular as it is the most productive oil crop: in fact, it yields more oil per hectare of land compared to other alternatives. Therefore, palm oil has been a natural choice to meet the increased demand. To meet this demand, the land devolved to palm oil production has increased from 3 million to almost 30 million hectares in the last 50 years (Ritchie, 2021). Of course, palm oil expansion has played a significant role in driving deforestation.

In 2022, Rainforest Action Network (RAN) – a non-profit environmental organization – released a report which provided evidence that deforestation is increasing in Indonesia, and that this was linked to suppliers of major consumer goods companies (Rainforest Action Network, 2022). According to RAN's investigation, palm oil produced in this area is still involved in products sold by large multinational companies as Procter & Gamble, Unilever, Colgate-Palmolive, Nestlé and PepsiCo – to name a few. The report claims that, despite commitment, these companies have failed to stop sourcing conflict palm oil. Indeed, deforestation for palm oil is still on the rise in the Rawa Singkil Wildlife Reserve in Indonesia, which is an important carbon sink and biodiversity hotspot. In this region, the investigation uncovered illegal palm oil plantations, whose palm oil enters in consumer products. Seven of the brands involved in RAN's investigation are also part of Forest Positive Coalition of Action, an initiative under the Consumer Goods Forum (CGF) aimed at ending commodity-driven deforestation. Despite being part of Forest Positive Coalition, the report claims that in 2022 these brands were still sourcing from traders involved in deforestation, including Singapore-based agribusiness Wilmar. In 2016, Wilmar was also involved in labour issues and workers' exploitation as stated in a report released by Amnesty International (Amnesty International, 2016).

Accusations against the above-mentioned companies for their involvement in the purchase of conflict palm oil – produced under conditions that cause environmental and social harm – are not new. In 2018, also Greenpeace raised similar concerns. Greenpeace investigation as well accused Wilmar of sourcing palm oil from groups responsible of

destroying rainforests and stealing land from indigenous communities (*World's Biggest Brands Still Linked to Rainforest Destruction in Indonesia*, 2018). Nonetheless, several well-known brands were still purchasing palm oil from Wilmar. According to the previously discussed RAN' report, this was still true in 2022, as the same brands were mentioned.

To conclude, there are numerous examples of social and environmental scandals similar to the ones described, and this suggests that the lack of visibility on lower-tier suppliers is an issue that remains far from being solved. Indeed, both social and environmental scandals still characterize today's multi-tier and global supply chains. While it is evident that labour exploitation, poor working conditions and deforestation occur upstream in the supply chain – and hence, they are difficult to detect – it is crucial that companies take responsibility to manage not only their direct suppliers but also suppliers' suppliers, which are often involved in unsustainable and unethical practices.

Chapter 3

3. Methodology

Fink (1998) defines a literature review as "a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents". Literature reviews facilitate the summarization and condensation of existing knowledge in a specific field and enable theory development (Sauer & Seuring, 2023). Moreover, a literature review may also assist in identifying research gaps in the extent literature that can guide future research (Koberg & Longoni, 2019). The aim of this literature review is to systematically analyse the existing literature on the role of power in cascading sustainability requirements and initiatives in a multi-tier supply chain, from the focal company to lower-tier suppliers. This purpose is accomplished by conducting a systematic literature review based on the structured process identified by Sauer & Seuring (2023). The whole process describing the methodology is summarised in the flowchart depicted in Figure 9, and it will be further explained in this chapter.

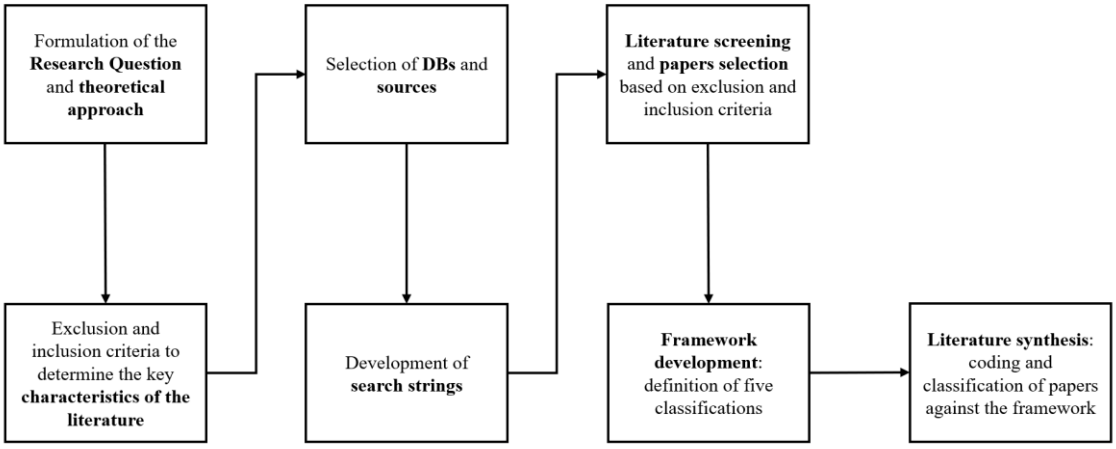

Figure 9. Methodology process

In the first step, the research question is formulated, as it is presented in Chapter 1. By examining the dynamics of power within supply chain relationships, this research aims to understand how dominant firms may drive or hinder the adoption of sustainable

practices in the lower tiers. This literature review employs a mixed methodological approach, integrating both deductive and inductive methods to provide a comprehensive analysis of the role of power in cascading sustainability initiatives in multi-tier supply chains. Adopting a mixed approach allowed to deepen existing frameworks, while also discovering new insights. More specifically, when classifications were developed from existing frameworks available in the literature, a deductive approach was employed: in this case established frameworks were the starting point that guided the review, and then papers were analyzed to find evidence that supported or refined the existing theories. Instead, an inductive approach was employed when new codes emerged based on findings and patterns observed in the selected sample of papers. In this case, based on data collected from the existing literature, new codes were developed. The concept of power is central to understand how focal firms may cascade sustainability initiative in lower supply chain tiers. This literature review draws on different power classifications, power sources and governance mechanisms and provides the foundation for examining the dynamics according to which firms are effective in diffusing sustainability.

Second, the required characteristics of the literature to be reviewed were determined. For this part of the process, inclusion and exclusion criteria are to be defined. To ensure the exclusion of poor-quality papers that would lower the quality of the review, only papers from journals listed in the classification of scientific journals drafted by AiIG (Associazione italiana Ingegneria Gestionale) were considered, selecting a prevalence of "gold-star", "gold" and "silver" quality. Also, relevant publication years were selected. The period analysed is the last 16 years, so papers published only between 2008 and 2023 were considered in the research. The relevant years were chosen starting from 2008 as this is the year of publication of the work of Seuring & Müller (2008). This work represents a seminal contribution to the field as a first formal definition of sustainable supply chain management is given, and thus it is a foundational reference in this field. Lastly, the analysis aimed only at papers in English language, therefore excluding papers in other languages.

At this stage, suitable literature sources and databases needs to be defined. Databases aggregating several management journals were selected and evaluated. For the purpose of this literature review, several combinations of keywords were searched in Scopus and in Web of Science research databases.

The following keywords string were used:

1. (sustainable supply chain management) AND (multi-tier supply chains OR supply networks) AND (power)

2. (power) AND (sustainab*) AND (multi-tier supply chains)

3. (power) AND (buyer-supplier relationships) AND (sustainab*)

4. (multi-tier supply chains) AND (sustainab*) AND (governance mechanisms OR power)

5. (power OR power asymmetries) AND (multi-tier supply chains OR socially responsible supply chains)

A total of 298 papers resulted from the keyword search. After removing duplicates, 288 articles remained for evaluation. At this point the evaluation and inclusion process started, aiming at selecting the pertinent literature. Initially, titles and abstracts were examined. First, papers with titles that emphasized sustainability but without a supply chain angle were excluded. Then, papers with titles that focused on technology solutions – i.e. Blockchain or IoT applications for Sustainable Supply Chain Management – were also excluded. Furthermore, several titles were completely out of scope as they referred to power in the context of energy and electricity sources, rather than the dynamics of control and influence within supply chain relationships. Then, abstracts of the remaining papers were examined. Papers that broadly discussed sustainability but did not mention neither power dynamics nor governance of the supply chain were excluded. Moreover, papers focusing only on technical aspects of supply chain management rather than relational aspects were excluded. These aspects are typically focused on improving efficiency or performance without considering the relational elements of how power and governance influence interactions between different actors in the supply chain. Exclusion criteria are summarized in Table 2.

Table 2. Exclusion criteria for papers selection

Exclusion criteria	Exclusion criteria for titles	Titles without a supply chain angle
		Titles focused on technology solutions, i.e. blockchain
		Titles focused on power intended as energy and electricity sources
	Exclusion criteria for abstracts	Papers with no power dynamics nor governance mechanisms involved
		Papers focusing only on technical aspects of supply chain management

At the end of this process, 17 papers were considered for further review and their full text was analysed in depth. In Table 3, for each string it is shown the number of papers obtained and the consequent papers included after applying the exclusion criteria. Some papers were retrieved through multiple research strings, ensuring sufficiency of the literature search.

Table 3. Research strings and corresponding papers

Research string	No. of papers	Papers included
(sustainable supply chain management) AND (multi-tier supply chains OR supply networks) AND (power)	185	Gruchmann, 2022 Wilhelm & Villena, 2021 Gold et al., 2020 Meqdadi et al., 2017 Tachizawa & Wong, 2014 Marttinen & Kähkönen, 2022
(power) AND (sustainab*) AND (multi-tier supply chains)	15	Marttinen & Kähkönen, 2022 Wilhelm & Villena, 2021 Wilhelm et al., 2016a Tachizawa & Wong, 2014
(power) AND (buyer-supplier relationships) AND (sustainab*)	20	Schutte et al., 2022 Dabhilkar et al., 2016 Touboulic et al., 2014
(multi-tier supply chains) AND (sustainab*) AND (governance mechanisms OR power)	26	Marttinen et al., 2023 Gong et al., 2023 Marttinen & Kähkönen, 2022 Wilhelm & Villena, 2021 Jia et al., 2019 Wilhelm et al., 2016 Tachizawa & Wong, 2014
(power OR power asymmetries) AND (multi-tier supply chains OR socially responsible supply chains)	52	Gemente et al., 2024 Marttinen et al., 2023 Wilhelm & Villena, 2021 Marshall et al., 2019 Wilhelm et al., 2016a Tachizawa & Wong, 2014 Hoejmose et al., 2013 Mena et al., 2013

In addition, references and citations from the 17 papers previously identified were used to identify additional papers relevant for the review, exploiting backward referencing search. After reading the full paper of Marttinen & Kähkönen (2022), three additional papers were identified as they were in line with the scope of the review: Meqdadi et al. (2019), Meinlschmidt et al. (2018) and Brockhaus et al. (2013). From Gruchmann (2022), Grimm et al. (2014) was found. Lastly, again through backward referencing, after reading Wilhelm & Villena (2021), Villena & Gioia (2018) was identified as appropriate for the review. Furthermore, Wilhelm et al. (2016b) was found through forward refencing from a previously identified paper from the same authors (Wilhelm et al., 2016a). Forward

referencing was also used to find the paper of Sharma et al. (2023), from Touboulic et al. (2014). Table 4 summarizes the papers found using background and forward referencing.

Table 4. Papers identified through backward and forward referencing in the literature review

Papers found through backward referencing	Meqdadi et al., 2019
	Meinlschmidt et al., 2018
	Grimm et al., 2014
	Villena & Gioia, 2018
	Brockhaus et al., 2013
Papers found through forward referencing	Wilhelm et al., 2016b
	Sharma et al., 2023

After the additional papers found by backward and forward referencing, a total of 24 papers was considered and analysed for the literature review. The whole process of papers search and selection in order to arrive to the final 24 papers is depicted in Figure 10.

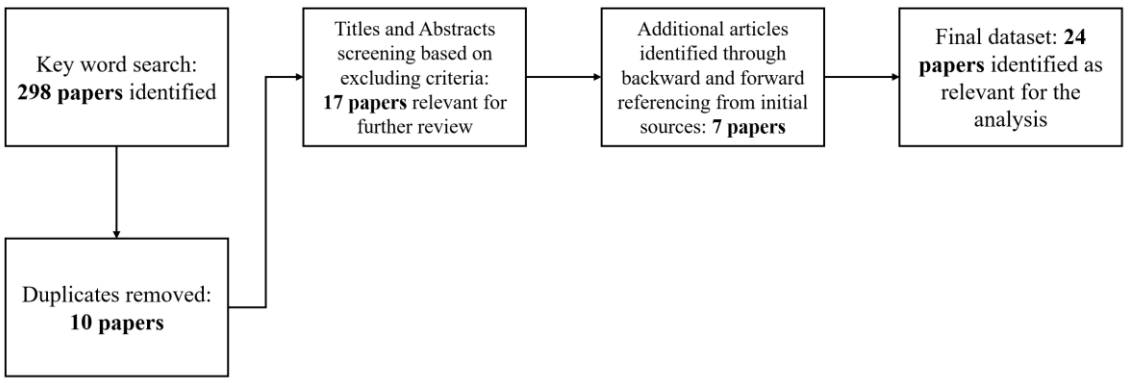

Figure 10. Article search, evaluation and exclusion process

Once the sample of papers had been defined, the content analysis was conducted. After reviewing the papers selected, a framework made by five key classifications was developed. This includes: (1) supply chain extent; (2) governance mechanisms; (3) types of power; (4) sources and dynamics of power; and (5) active and passive firms. These categories represent the main findings that emerged from the analysis. In some cases, categories were developed based on existing frameworks in literature. As the five categories were established, each paper was carefully read and examined through the lens of these identified categories. This detailed review of each paper was mainly to search for insights and information that could be relevant for the developed framework.

Firstly, papers were classified according to the extent of the supply chain that they covered following an inductive approach. In MT-SSCM field, there is not an existing classification on supply chain extent that is widely accepted by the literature. Thus, the following categories were defined to analyze the vertical complexity: dyad, triad, and multi-tier. The dyad is the classic model used in Supply Chain Management literature. For the triad, a reference point is Mena et al. (2013), which goes beyond the dyad encompassing interactions among three entities. Then, multi-tier category encompasses all configurations beyond triadic level, as outlined in Tachizawa & Wong (2014). Indeed, each paper of the sample was classified into dyadic, triadic or multi-tier supply chain, based on the supply chain structure discussed within the study, thus capturing the vertical complexity of the supply chain. Additionally, also horizontal complexity was considered. While it was possible to classify all the papers in the sample by the extent of the supply chain, horizontal complexity was less common and just a few papers were included in this category.

For the papers that covered at least three tiers of the supply chain, governance mechanisms were examined, and papers were classified under this category if they focused on how relationships with suppliers are managed. As previously mentioned, for this specific category, papers were analyzed based on an existing framework developed by Tachizawa & Wong (2014), thus adopting a deductive approach. The framework identifies four different governance mechanisms approaches: “direct”, “indirect”, “work with third parties”, “don’t bother”. The criterion for including papers in this classification was the presence of evidence or examples demonstrating the approaches of the chosen framework.

A similar deductive process was followed to define the classification which explored different types of power. In this case, the chosen framework from the literature was the one of Raven (1959), which provides five different types of power: expert, referent, legitimate, coercive and reward. Also in this case, papers were carefully analyzed and examined for references of coercive, reward, legitimate, referent and expert power.

Sources and dynamics of power were also defined in a category, and deeply explored in the papers using an inductive approach. For this category, the classification process involved two steps. First, papers were read to identify what sources of power companies may possess. Then, papers were re-examined to explore the relational dynamics that verify when the buyer or the supplier are in a position of power. Thus, the criterion to include papers in the classification was in this case the presence of explicit examples illustrating both sources of power and power dynamics in buyer-supplier relationships.

Lastly, factors emerging from the papers that determine whether a firm is active or passive in spreading sustainability requirements and initiatives were coded in the last category. In this case, the classification criterion was based on the presence of evidence showing whether sustainability initiatives effectively reached lower tiers. Then, an exploration of the causes contributing to the effectiveness or ineffectiveness of the spreading of the initiatives followed, exploiting an inductive approach.

To synthetize, an inductive approach was adopted for the classification of supply chain extent, sources and dynamics of power and active and passive firms. On the contrary, a deductive approach was implemented for types of power and governance mechanisms. Outlined categories and theoretical approaches are summarized in Table 5.

Table 5. Categories identified and corresponding theoretical approaches

Category	**Approach**
Supply chain extent	Inductive approach
Type of power	Deductive approach
Governance Mechanisms	Deductive approach
Sources and dynamics of power	Inductive approach
Active and Passive firms	Inductive approach

By integrating the deductive review of governance mechanisms and types of power with the inductive classification of sources and dynamics of power, supply chain extent, and active or passive behaviors, a deep understanding of how power influences sustainability initiatives was achieved. This mixed-method approach allowed to validate established framework while also incorporating new perspectives derived from the literature. Chapter 5 will present and in-depth explore the categories.

Chapter 4

4. Bibliometric analysis

This chapter presents the results of the descriptive analysis, highlighting key trends distribution within the sample of papers analysed.

The sample was selected based on the criteria descripted in Chapter 3, and it is composed of 24 papers in total. The objective of this section is to assess research trends and bibliometric data of the papers analysed.

Papers selected after applying exclusion criteria were published in the years between 2013 and 2024. Most of the articles (58%) were published after 2018. As regard the distribution of papers over time, there is no particular trend to highlight. As it is shown in Figure 11, the distribution of publications appears to be relatively even across the period analysed. This suggests that the impact of power dynamics in multi-tier sustainable supply chains has been a steady area of research over time, without any specific peaks.

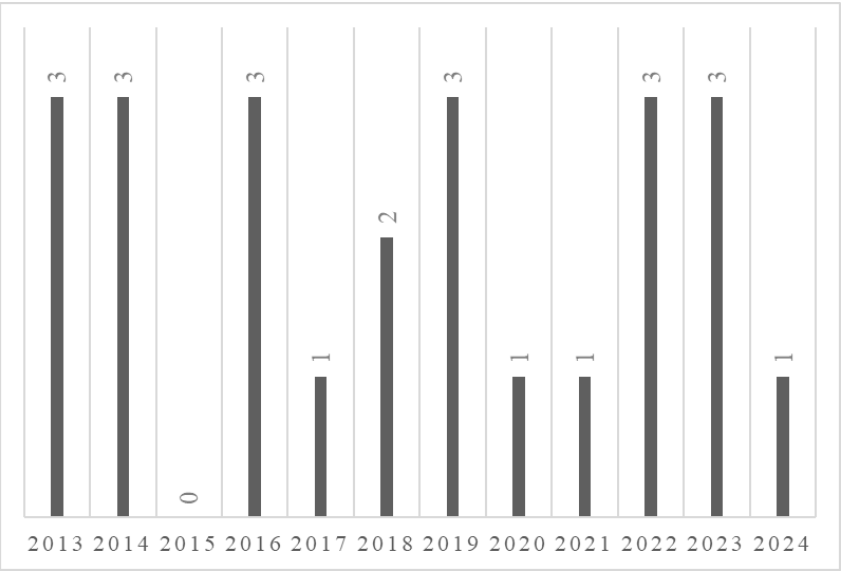

Figure 11. Article distribution across the reviewed timeframe

Moreover, the limited number of papers (24) highlights the scarcity of literature in this field. While interest exists, there is room for further exploration and development in this area.

Papers are distributed across 15 journals. The distribution of papers across journals is equilibrated, and there is no journal responsible for more than three papers, as shown in Table 6. Nonetheless, International Journal of Operations and Production Management (13%) and International Journal of Production Economics (13%) show the highest percentages. In general, there is a good spread of journals, showing that this research topic spans various specializations. The majority of the papers is published in outlets from the Operations Management and Supply Chain Management (SCM) field. Hence, this means that research is mostly guided by experts in SCM rather than in sustainability.

Table 6. Reviewed paper distribution across journals

Journal Title	**Articles (n=24)**
International Journal of Operations and Production	3
International Journal of Production Economics	3
Supply Chain Management	2
International Journal of Logistics Management	2
Journal of Operations Management	2
Production Planning and Control	2
Journal of Business Ethics	2
Production and Operations Management	1
Journal of Supply Chain Management	1
International Journal of Production Research	1
Industrial Marketing Management	1
Decision Sciences	1
Operations Management Research	1
Journal of Business Logistics	1
Journal of Industrial Ecology	1

The analysis of citation data reveals the most influential papers within the selected ones, as reflected by their high citation counts. In Table 7, the first five most cited papers on Scopus research database are summarized.

Table 7. Most cited papers on Scopus research database

Paper	No. of citations
Wilhelm et al., 2016	405
Grimm et al., 2014	370
Mena et al., 2013	349
Tachizawa & Wong, 2014	315
Touboulic et al., 2014	244

As regard methodology approaches, 8 different research methodologies emerged: (1) case studies; (2) surveys; (3) literature reviews; (4) theoretical and conceptual papers; (5) modelling papers; (6) grounded theory; (7) regression analysis; and (8) field study. The frequency of the different methodology approaches is shown in Figure 12. As shown in the chart, the distribution reflects a strong emphasis on case study research, with papers employing case study methodology representing 54% of the sample. Despite the predominance of qualitative research methodology, the sample of papers present methodological diversity.

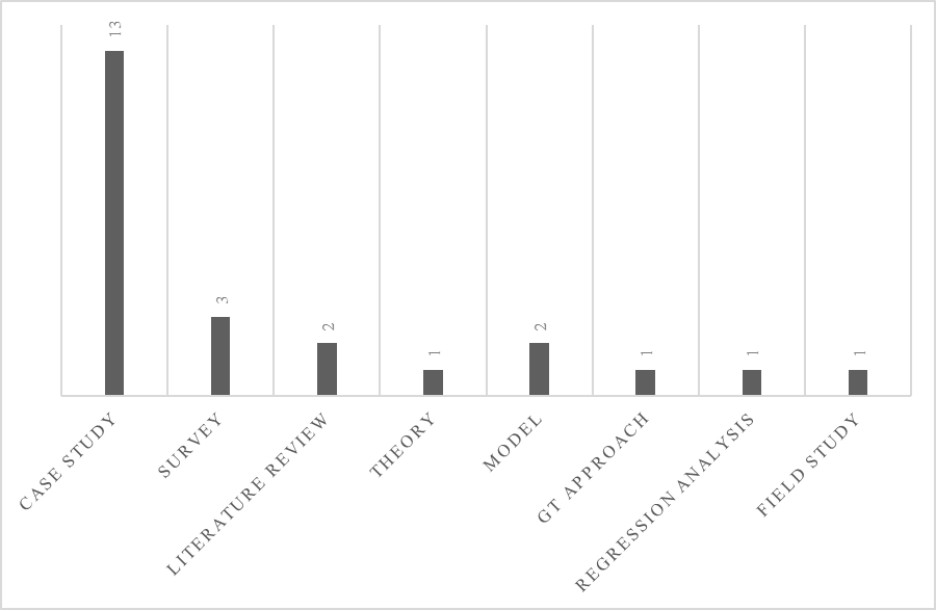

Figure 12. Research methods

Chapter 5

5. Content Analysis

In this section, the results of the content analysis of papers selected for the literature review on the role of power in cascading sustainability initiatives are presented. The aim of a content analysis is to synthetize findings from the reviewed papers (Sauer & Seuring, 2023). The main objective of this section is to identify and code crucial elements emerged from the analyzed literature. Indeed, the content analysis involved systematically reviewing the literature to identify and categorize key themes relevant to the research question. The sample of selected papers was reviewed to assess their applicability to existing theoretical frameworks and to identify new emergent codes in their content. The five categories under which papers have been classified – which are the output of the content analysis – are now presented.

5.1 Supply chain complexity

This section aims at classifying the reviewed papers based on supply chain complexity, which is intended as both supply chain extent, or vertical complexity, and horizontal complexity. This classification is useful to understand whether the selected papers discuss power dynamics in a dyadic, triadic or multi-tier context, and the impact of horizontal complexity.

When analysing supply chain complexity, both horizontal and vertical complexity must be considered. Supply chain complexity is a very important factor for the focal company when managing suppliers and sub-suppliers. Vertical complexity refers to the extent of the supply chain and it is defined as the number of jumps in the network, hence the number of tiers of network participants (Gruchmann, 2022). There are three possible configurations for supply chains regarding its extent: dyadic, triadic and multi-tier, as shown in Figure 13. Dyadic involves two participants, triadic involves three participants and multi-tier is intended as the broader network.

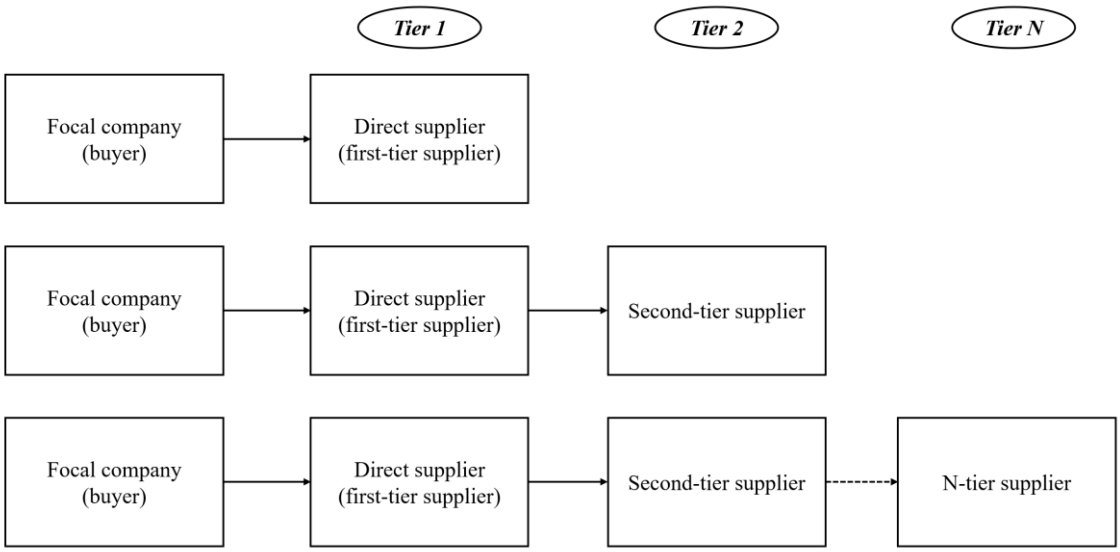

Figure 13. Dyadic, triadic and multi-tier supply chains

In the sample of papers reviewed, 17% analyses a dyadic supply chain, 33% a triadic one and lastly 50% a multi-tier network, as it is shown in the graph of Figure 14.

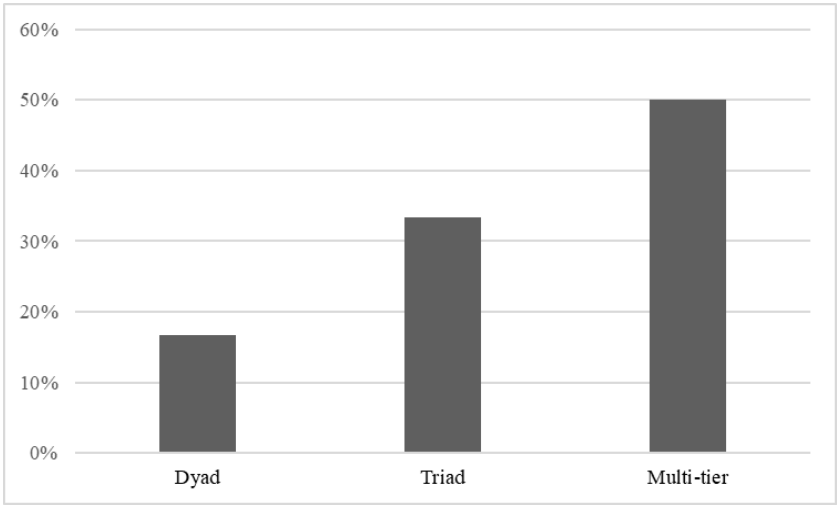

Figure 14. Percentage of papers describing different supply chain structures

Although some studies have been limited to dyads, the analysis of sustainability from a focal company or dyadic perspective may give just a partial and myopic view to the successful implementation of sustainability initiatives. In the recent literature, the importance of adopting a network perspective has been highlighted, as the simpler dyadic

relationship prevents the evaluation of the impact of sustainability strategies in the lower tiers of the network (Meqdadi et al., 2017).

5.1.1 Dyadic supply chains

For the dyadic category, the relationship between two tiers is analysed: it involves the focal company and the first-tier supplier. In Schutte et al. (2022), buyer-supplier relationship is explored, by analysing the dyad consisting of a South African hospital, e.g. the buyer, and each single supplier. Sharma et al. (2023) analyse sustainability initiatives and power dynamics in a dyadic supply chain focusing on a single manufacturer and a single retailer. Similarly, Dabhilkar et al. (2016) explore single buyer-supplier relationship, with a focus on the purchasing capabilities. Lastly, also the analysis of Hoejmose et al. (2013) is based on a sample of dyadic relationships, drawn from UK companies, in which joint dependence, supplier power and their impact on the implementation of socially responsible supply chain practices are explored.

5.1.2 Triadic supply chains

The dynamic of triadic relationships is largely present in the papers, the unit of analysis in this case is the triad buyer-supplier-supplier. Touboulic et al. (2014) analyse multiple triadic relationships involving a large buyer and small suppliers, highlighting the key role of first-tier suppliers in diffusing sustainability engagement with second-tier suppliers. Also, Meqdadi et al. (2019) explore the impact of coercive and non-coercive power in the diffusion of sustainability beyond the dyad. Moreover, in the systematic literature review conducted by Gemente et al. (2024), an important finding is that the triad is the smallest unit of a multi-tier supply chain: by analysing this type of relationship it is possible to consider the impact of a third actor on the relationship between two others. When dealing with three-tier supply chains, Mena et al. (2013) give an important contribution by identifying three types of triads: open, closed and transactional. In their research, the traditional supply chain is represented by the open configuration, with no direct contact between the buyer and the supplier's supplier. On the contrary, when there is direct contact through a formal link between the buyer and the supplier's supplier, the triad configuration is defined as closed. The transitional multi-tier supply chain instead can be defined as an initial closed supply chain, in which the buyer and the supplier's supplier

start to be in contact and establish a first relationship. Jia et al. (2019) add a configuration to the three types of triadic supply chain structures developed by Mena et al. (2013) and introduce a fourth configuration: closed plus triadic supply chain structure. In this scenario, the focal company develops a direct relationship with a new lower supplier, and, once the supplier has become a qualified partner, it is introduced by the focal company to its first tier. Wilhelm et al. (2016a), while analysing the double agency role of first-tier suppliers, select a sample of focal firms and for each firm at least one main upstream supply chain is selected, which is operationalised as a simple three-tier structure. Likewise, in a different work, Wilhelm et al. (2016b) investigate sustainability management strategies of focal companies from different industries with second-tier suppliers and beyond but operationalise the identified supply chains as three-tier supply chains. This, according to the authors, although simplifying the approach, allows to capture a higher level of complexity compared to the dyadic supply chain structure consisting of buyer and supplier. In conclusion, through a multiple case study which involves several companies covering three supply chain tiers, Marttinen et al. (2023) identify 12 mechanisms to be implemented in order to ensure supply chain sustainability.

5.1.3 Multi-tier supply chains

The most recurrent perspective in the analysed papers is nonetheless the broader multi-tier supply chain or network. In Marshall et al. (2019), the focus is on the key role of first-tier suppliers: the authors explore which type of power (e.g. mediated and non-mediated) influence the adoption of socially sustainable procurement practices by first-tier suppliers and help them diffusing the initiatives in the lower tiers. Wilhelm & Villena (2021) explore again a large buyer relationship with its first-tier suppliers, and which factors enable first-tier suppliers to cascade the sustainability initiatives started by the buyer to lower-tier suppliers, thus analysing the broader supply chain. Marttinen & Kähkönen (2022) study power in the context of multi-tier supply chain: to do so, they analyse a sample of Finnish companies and their relationship with first and lower-tier suppliers. In the context of multi-tier supply chains, they identify several power sources and demonstrate that they are related to the ability of the focal firms to cascade sustainability initiatives upstream in the network. Gold et al. (2020) adopt the perspective of the network, and thus a multi-tier point of view, in order to correlate the impact of the key

structural network characteristics on the diffusion of labour standards, examining supplier-subcontractor networks where the buyer is not in a direct contractual relationship with all the actors of the supply chain. Adopting a power perspective, also Gruchmann (2022) explore the impact of network characteristics. Tachizawa & Wong (2014) highlight that, in previous literature, sustainability practices are analysed mainly in terms of dyadic and triadic relationships but try to adopt a network perspective: the result of their systematic literature review is the development of a framework that identifies governance mechanisms and contingency variables to manage multi-tier supply chains and lower-tier suppliers. The management of lower tiers in multi-tier supply chains and the approaches that can be adopted in a network context are also explored by Meinlschmidt et al. (2018). Starting from previous works present in the literature, governance mechanisms from a multi-tier supply chain perspective are also the focus of the work of Gong et al. (2023): the authors present a case study on IKEA's sustainable cotton initiative in China and delve into governance mechanisms adopted by focal companies to deal with first-tier and lower-tier suppliers. Villena & Gioia (2018) study three supply networks in different industry and find that lower tiers represent the major risk and mostly address passively sustainability issues. The authors also develop a framework to manage sustainable supply networks. Sub-suppliers' management to ensure compliance with sustainability standards is also the focus of the work of Grimm et al. (2014): adopting a network perspective, 14 critical success factors for sub-suppliers' management are identified. By interviewing a sample of people covering different roles and position in the broader supply chain from European and American companies, Brockhaus et al. (2013) identify two approaches to manage sustainability in multi-tier supply chains: sustainability initiatives can be diffused in a multi-tier supply chain in a mandated or collaborative way. Lastly, adopting a network perspective, Meqdadi et al. (2017) study the impact of trust and power on the diffusion of sustainability across supply networks: for the purpose, the spreading of a sustainability initiative in the bio-chemical industry is analysed, together with the perception on power and trust of multiple actors across several tiers of the supply network.

5.1.4 Horizontal complexity

Horizontal complexity instead is referred to a single supply chain tier and it is defined as the number of actors or suppliers who participate in each tier (Wilhelm et al., 2016), as shown in Figure 15. Intuitively, and similarly to supply chain extent, the more are the actors involved in the single tier, the more it is difficult to coordinate it. Meinlschmidt et al. (2018) state that a large number of lower-tier suppliers causes high perceived sustainability risk as there is less visibility in the supply chain. An horizontal relationship is basically a link between suppliers, e.g. supplier-supplier relation. Supplier-supplier relations are complex and of key importance for the focal company, as they influence also the buyer-supplier relationship, and thus must be managed as well (Touboulic et al., 2014). In the sample of papers analysed, only a minority (17%) addresses horizontal complexity, and this suggests that there exists a gap in the literature on this theme. All the papers analysed account for vertical relationships across tiers, but the majority neglects the power dynamics that may arise from the number of suppliers in the same tier.

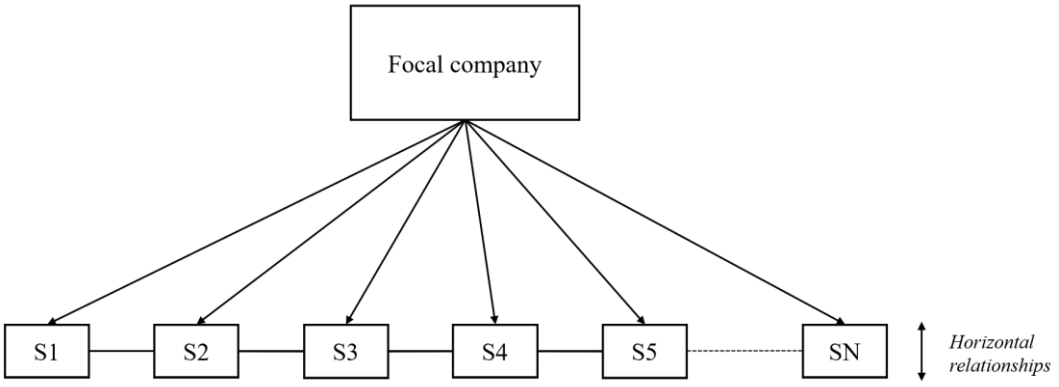

Figure 15. Horizontal relationships

Touboulic et al. (2014) affirm that horizontal relationships are affected by both cooperation and competition. In the analysed case study, it is shown that the buyer has interest in controlling the relationship between suppliers for two reasons: to implement its sustainability goals and to foster competition between them in order to achieve economic goals. Nonetheless, if suppliers collaborate with each other, it is likely that they

develop resistance and bargaining power shifts in favour of the supplier. Resistance generated by the interaction between suppliers counteracts buyer influence in implementing sustainable supply chain management. Also, Gold et al. (2020) analyse subcontracting and how it affects the diffusion of labour standards through the network. In particular, sub-suppliers raise horizontal complexity in each supply chain tier (Gold et al., 2020). Nonetheless, the hypothesis of horizontal complexity negatively affecting labour standards in the network is rejected in this study, unlike vertical complexity and supplier-subcontractor centrality and density which have all negative effects on labour standards adoption. Specifically, authors point out that high centrality of first-tier suppliers provide them power against buyers. Gruchmann (2022) as well dive into supply network characteristics from a power perspective and the main result of the study is that when complexity – both vertical and horizontal – is high, direct governance is not sufficient to ensure a strong sustainability performance in the network, but instead non-mediated forms of power are needed. Lastly, Wilhelm et al. (2016b) depict horizontal complexity as a key contingency factor for buying firms when managing sub-suppliers: power dynamics related to horizontal complexity can either enhance or hinder the effective management of sustainability in multi-tier supply chains. The authors claim that low level of horizontal complexity in the first tier enables delegation of sustainability management to lower-tier suppliers when institutional distance is low, while a high level of complexity at second tier (thus, having many sub-suppliers) implies challenges for managing sustainability when there is high institutional distance. Intuitively, if the horizontal complexity at second tier is high, buyer's dependency on the first tier to manage sustainability upstream increases.

Table 8 summarizes all the papers analysed in this literature review, indicating their focus in terms of dyadic, triadic, multi-tier contexts, and whether they address horizontal complexity. As it was briefly mentioned, in the sample of papers there is significant clarity on vertical complexity, but not on horizontal complexity. This suggests that research is mainly focused on the former, while the latter may have been overlooked. Indeed, none of the papers focused specifically on this concept, and this reveals a potential research gap in the literature.

Table 8. Focus of papers analysed

Supply chain extent Or Vertical complexity	Dyadic supply chain	Schutte et al., 2022 Sharma et al., 2023 Dabhilkar et al., 2016 Hoejmose et al., 2013
	Triadic supply chain	Meqdadi et al., 2019 Touboulic et al., 2014 Gemente et al., 2024 Mena et al., 2013 Wilhelm et al., 2016a Wilhelm et al., 2016b Marttinen et al., 2023 Jia et al., 2019
	Multi-tier supply chain	Marshall et al., 2019 Touboulic et al., 2014 Gold et al., 2020 Tachizawa & Wong, 2014 Meinlschmidt et al., 2018 Wilhelm & Villena, 2021 Villena & Gioia, 2018 Grimm et al., 2014 Brockhaus et al., 2013 Gruchmann, 2022 Gong et al., 2023 Meqdadi et al., 2017
Horizontal complexity	Touboulic et al., 2014 Gruchmann, 2022 Gold et al., 2020 Wilhelm et al., 2016b	

5.2 Governance Mechanisms

Governance mechanisms can be defined as practices used by focal companies to address sustainability issues with suppliers and sub-suppliers. Thus, governance mechanisms encompass initiatives employed by firms to regulate interactions between supply chain actors (Marttinen et al., 2023). Companies demonstrate their commitment to sustainability and its management across various levels by implementing governance mechanisms (Marttinen et al., 2023). In general, governance mechanisms are a mean through which sustainability can be diffused and extended to lower tiers of the supply chain. Indeed, governance mechanisms employed across the supply chain play a pivotal role in determining how effectively sustainability goals cascade from one tier to another. This section will build upon an established framework in the literature to categorize governance mechanisms and highlight their relevance in the context of power dynamics.

Tachizawa & Wong (2014) give a precious contribution regarding this research area and identify four main approaches that focal companies can implement to manage its supply chain lower tiers: “direct”, “indirect”, “work with third party”, “don’t bother”. A similar result is the one of Wilhelm et al. (2016), which identifies the same four possible types of multi-tier supply chain: “open”, “closed”, “third party”, and “don’t bother”, where the open and closed configurations are derived from the work of Mena et al. (2013). These four approaches can be used to address sustainability of suppliers. To manage sustainability, firms may also use a combination of the four approaches (Tachizawa & Wong, 2014). The four approaches are indeed complementary to each other, and a firm may have the need to use more than one simultaneously. In particular, it is highlighted that the more the supply chain is complex, the more there is the need to diversify the governance mechanisms used.

Marttinen et al. (2023) point out that several factors influence the adoption of different configurations of governance mechanisms, the more relevant being power dynamics established between members of the supply chain, perceived sustainability risk and supplier’s sustainability expertise and capabilities. Meinlschmidt et al. (2018) claim that “perceived sustainability risk” is a key variable when focal companies decide which approach to adopt when managing lower tier suppliers. Perceived sustainability risk is defined as a buyer firm’s perception of how likely it is to incur in negative sustainability-

related event within the supply network. In general, the higher the perceived sustainability risk, the more firms will use resource-intensive governance mechanisms (Meinlschmidt et al., 2018).

Moreover, contingency theory suggests that there is not a single approach to manage a business or a process, but the approach depends on the specific situation. Tachizawa & Wong (2014) identify some contingency variables that can affect the mechanism chosen. Contingency variables are factors that influence which management approach the lead company will choose. Thus, contingency variables have an influence on the approach chosen. The variables identified in the study are seven: power, stakeholders' pressure, industry, material criticality, dependency, distance and knowledge resources.

1. Power

Power can be categorized as economic (negotiation power) and non-economic (industry influence), but it can also be distinguished as possession of resources and supply chain position. In general, power refers to the capacity of a firm to influence the activities of other members of the network. The collaboration between buyer and suppliers is largely influenced by power distribution. This variable is also present in Wilhelm et al. (2016) and referred to as power asymmetry.

2. Stakeholders' pressure

Large and visible firms are more exposed to pressure. When this situation verifies, firms are more likely to take a proactive approach. This will result in larger and more visible companies placing more emphasis on the sustainability dimensions pointed out by NGOs. On the contrary, less visible firms tend to establish a reactive approach, waiting longer to establish links with other agents in the supply chain.

3. Industry

Studies demonstrate that firms in static industries invest more in environmental practices compared to firms in dynamic ones. Thus, standards may be less effective in an environment where technological change is significant. Also, it is important to notice that some industries have more pressure comparing to others. For example, high-pollution industries are subject to intense institutional pressure for performance improvement and

thus they are more proactive, while low-pollution sectors face less intense institutional pressure and therefore wait longer to adopt sustainable practices.

4. Material criticality

Often, high criticality materials require that the firm establishes a direct approach with lower-tier suppliers. Criticality of a material is associated with the impact on the final product quality or sustainability. On the contrary, material which are not critical may lead to the firm approaching sub-suppliers with indirect or don't bother approach, as they are not crucial for the final product.

5. Dependency

The degree to which a firm depends on other actors of the supply chain, as known as dependency, affects the adoption of sustainable practices. Dependency is intended as the relying on other supply chain members for critical resources and capabilities. There is evidence of a positive relationship between dependency and sustainable practices.

6. Distance

Distance can be intended in many ways: for example, physical, social or cultural. The more distance between supply chain members, the more there is information asymmetries and coordination efforts are needed. This variable is also present in Wilhelm et al. (2016) and it is referred to as institutional distance.

7. Knowledge resources

Knowledge resources in this framework refer to the expertise that the focal firm has in managing suppliers' sustainability. Firms, even large ones, may lack the knowledge and the expertise to manage the sustainability of suppliers, and this is why they often associate with NGOs and other relevant third parties.

The following section will classify selected papers focused on three-tier or multi-tier supply chains according to the four governance mechanisms found by Tachizawa & Wong (2014), shown in Figure 16.

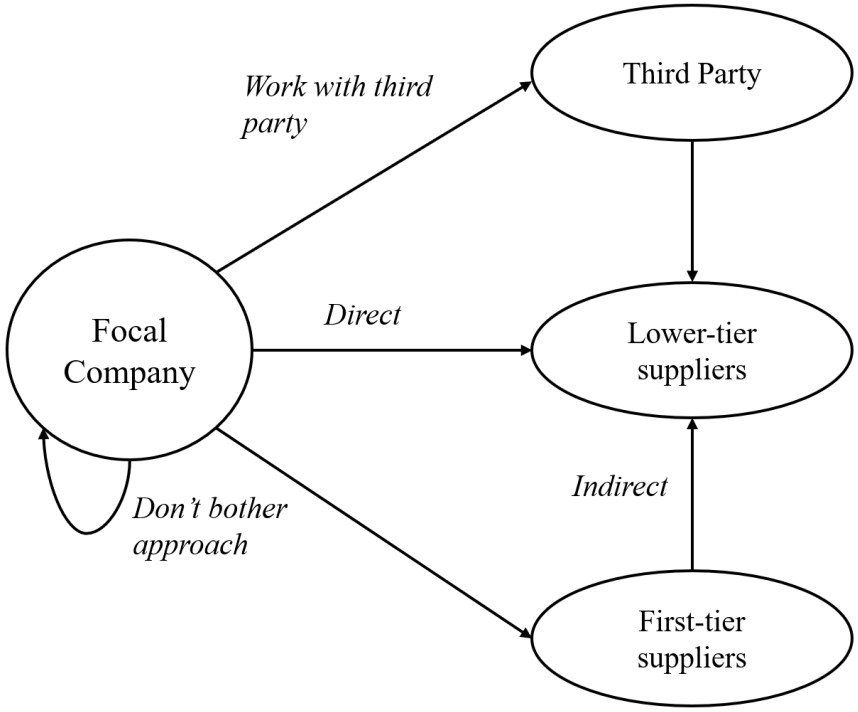

Figure 16. Multi-tier SSCM governance mechanisms (Tachizawa & Wong, 2014)

5.2.1 Direct approach

In this configuration, the focal company establishes a direct relationship with lower-tier suppliers, bypassing first tier suppliers. There is in this case direct access to sub-suppliers, and thus focal companies can directly monitor and collaborate with them to spread sustainability initiatives. This approach is also defined in Mena et al. (2013) as a closed configuration supply chain, as shown in Figure 17.

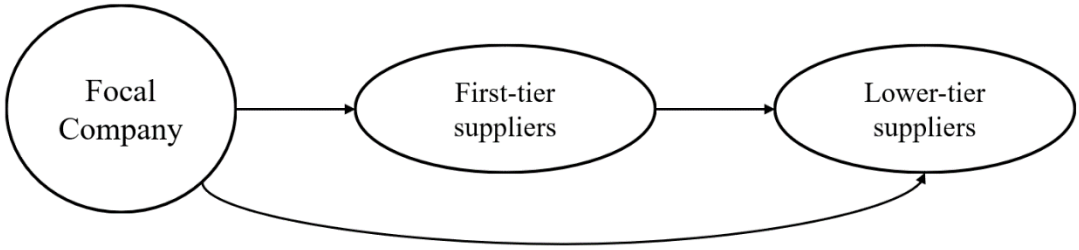

Figure 17. Closed supply chain (adapted from Mena et al., 2013)

Adopting a direct approach can lead to a reduction of information asymmetry due to the greater interaction with lower-tier suppliers, but the management effort required by the focal company is higher as the lead firm must directly identify, monitor and manage sub-suppliers.

From the analysed sample of papers, it emerged that practices involved when implementing this method are assessing and monitoring suppliers, providing assistance to suppliers, direct sourcing and joint sustainability development (Marttinen et al., 2023; Tachizawa & Wong, 2014), as it is shown in Table 10. Buying companies directly select and evaluate their suppliers using their own resources, as it is specified in the work of Meinlschmidt et al. (2018). This study also identifies four additional approaches within the category of direct governance mechanism: holistic approach, product specific and region specific approach, event specific approach.

1. Holistic approach

This approach provides the highest likelihood of controlling and coordinating the supply chain, but it also requires high resource intensity. In fact, it is said to be effective in identifying misconduct in the upstream supply chain. This approach is, as previously said, very resource-intensive, as large companies (buyers) manage their lower-tier suppliers regularly and in a proactive manner. The focal company in the study of Meinlschmidt evaluates environmental and social performance of both direct and indirect suppliers and indicate them where to source from, thus adopting a proactive sustainability approach.

2. Product specific approach

The buying firm in this case evaluates its lower-tier suppliers depending on the purchased product. Focal firms in this case do not manage and evaluate their lower suppliers regularly, but they do so just in case of critical products. Thus, direct monitoring is expected only depending on the criticality of the product supplied. In the study of Meinlschmidt et al. (2018), one of the focal companies only controlled first-tier suppliers, but regarding palm oil it controlled up to lower tiers of its supply chain.

3. Region specific approach

The logic is the same as the one of product specific approach. This approach is applied to suppliers who are based in critical regions, were social and environmental misconduct are

likely to verify. As it emerges in the study, companies audit just second-tier suppliers located in critical regions (e.g. Asia) where non-compliance with labour standards is often likely to happen.

It is important to notice that the region specific and product specific approaches are often applied in a combination, and they appear to be less effective with respect to the holistic approach. However, they are also less resource intensive compared to the holistic approach. Moreover, Villena & Gioia (2018) mention evidence of direct product specific approach: Honda controls lower-tier suppliers for critical components, but gives the responsibility to top-tier suppliers to manage their own suppliers for the rest of the items.

4. Event specific

This last approach is defined as a reactive measure. In this case focal companies are not proactively engaged in auditing and managing critical lower tier suppliers, they do so when there is evidence of misconduct by a lower-tier supplier. Of course, this approach is the least effective, compared to the previously mentioned ones. A reason to implement direct auditing could be for example the discovery child labour in a supplier.

This further classification is summarised in Table 9.

Table 9. Classification of direct governance mechanism

Direct governance mechanism	Holistic approach	The focal company evaluates the sustainability performance of first and lower-tier suppliers proactively on a regular basis.
	Product specific	The focal company evaluates directly first and lower-tier suppliers only in the specific case of critical products.
	Region specific	The focal company evaluates directly first and lower-tier suppliers only when they are based in critical regions.
	Event specific	The focal company evaluates the sustainability performance of first and lower-tier suppliers reactively only if there is evidence of misconduct.

Tachizawa & Wong (2014) claim that practices of direct approach are assisting directly lower-tier suppliers, direct sourcing and direct monitoring. Through a multiple case study,

Jia et al. (2019) analyse governance mechanisms in three multinational companies' multi-tier sustainable supply chain in China. In the three case studies analysed there is evidence that companies apply multiple approaches in a combined way. There is proof of direct method as IKEA, one of the companies analysed, provide trainings and workshops to first tier, but also to second-tier suppliers. Also, both IKEA and Tetrapack identify second-tier suppliers and then introduce them to first-tier suppliers. Specifically, this is evidence of a closed plus triadic supply chain structure, a configuration that extends the work of Mena et al. (2013). Gong et al. (2023) provides useful insights about how a company can apply a direct governance mechanism. The focus of the study is to further dive into IKEA's cotton initiative in China, to make cotton production more sustainable. There is evidence of direct approach also as IKEA has a relationship with second-tier suppliers, so the close supply chain configuration seen in Mena is applied. Also, there is evidence of a direct governance mechanism, as the company organizes workshops and trainings with its suppliers which are also extendable to suppliers' suppliers. IKEA also audits and visits sub-suppliers. Marttinen et al. (2023) emphasize that trainings provided by focal companies play a crucial role in helping suppliers to build sustainable capabilities. For example, one of the companies analysed in their study offers an e-learning course focused on its Code of Conduct (CoC), which is provided to all suppliers. Additionally, trainings can be organized collaboratively with several industry partners, to support suppliers' capabilities. However, it is important to note that trainings were not commonly used by the case firms studied by Marttinen et al. (2023). Trainings can also take the form of knowledge exchange, where buyers organize seminars and workshops to share information about sustainability issues with their suppliers. Supplier visits, on the other hand, are used by focal companies to assess and monitor how suppliers operate. Authors distinguish between first, second- and third-party audits. First-party audits are internal evaluations conducted by a company on itself, second-party audits are performed by a company on its suppliers to ensure compliance, and third-party audits are carried out by independent organizations to assess adherence to industry standards or certifications. Marttinen et al. (2023) refer to these practices — such as training, visits, and assessments — as "assessment practices". These practices include the evaluation and selection of suppliers based on the focal firm's sustainability requirements and private standards, such as Codes of Conduct. Codes of Conduct serve as a tool for firms to communicate their minimum sustainability requirements and standards to suppliers. The authors argue that

assessing suppliers against such standards is one of the most important practices a focal company can adopt, which aligns with the findings of Tachizawa & Wong (2014). There is direct approach implementation also when direct sourcing is applied. For instance, Meinlschmidt et al. (2018) and Gong et al. (2023), provide evidence where focal companies maintain a list of preferred suppliers for their operations. In the apparel industry, Wilhelm et al. (2016b) highlight a company that sets specific Key Performance Indicators (KPIs) for sustainability and communicates these directly to second-tier suppliers. This company also directly audits second-tier suppliers due to the limited sustainability management capabilities of first-tier suppliers. To ensure compliance, the focal company deploys a team of auditors to monitor the main sourcing regions. Lastly, also joint sustainability development can be considered as part of direct approach: in Marttinen et al. (2023), this is the case when a focal company starts a sustainability-related project in strict collaboration with suppliers and sub-suppliers. Joint development initiatives aimed at sustainability are reported by four out of five focal firms, as well as many first-tier and lower-tier suppliers. These collaborative projects are focused on transparency and sustainability and involve working not only with direct suppliers but also with suppliers further down the supply chain, highlighting a multi-tier collaboration approach.

Table 10. Evidence of direct approach in the papers analysed

Direct approach	Supplier Assessment and monitoring	Focal company has a close relationship with second-tier suppliers.	Gong et al. (2023)
		Focal company organizes field visits to suppliers, thus performing second-party audits.	Marttinen et al. (2023)
		Focal company audits and visits lower tiers.	Gong et al. (2023)
		Focal company offers courses focused on its Code of Conduct to suppliers.	Marttinen et al. (2023)
		Focal company organises interactive seminars and events to support supplier's learning about sustainability themes.	Marttinen et al. (2023)
		Focal company directly audits second-tier suppliers due to the limited sustainability management capabilities of first-tier suppliers.	Wilhelm et al. (2016b)
		Focal company directly communicate sustainability KPIs to lower tiers.	Wilhelm et al. (2016b)
	Providing assistance to suppliers	Focal company provides trainings directly to first and second-tier suppliers.	Jia et al. (2019)
		Focal company organizes various forms of trainings and workshops to suppliers, extendable to lower tiers.	Gong et al. (2023)
	Direct sourcing	Focal company provides a list to supplier of where to source from.	Meinlschmidt et al. (2018)
		Focal company identifies second-tier suppliers and introduce them to first-tier suppliers.	Jia et al. (2019)
		Focal company shares a preferred sourcing list to suppliers.	Gong et al. (2023)
	Joint sustainability solution development	Focal company initiates sustainability-related projects in a strict collaboration with lower tier suppliers.	Marttinen et al. (2023)

5.2.2 Indirect approach

The direct managing of lower-tiers suppliers is not common, more likely focal companies tend to delegate sustainability issues to the next supply chain tier (Marttinen et al., 2023). This approach is also defined in Mena et al. (2013) as an open configuration supply chain, as shown in Figure 18.

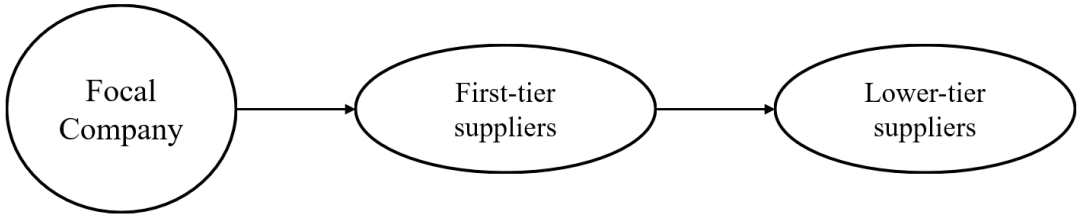

Figure 18. Open supply chain (adapted from Mena et al., 2013)

The indirect approach prescribes that "focal companies establish contact with lower-tier suppliers indirectly through another supplier" (Tachizawa & Wong, 2014). The logic is the following: focal company asks for compliance with requirements to first-tier suppliers and exercises its power and influence so that first tier does the same with lower tiers. Therefore, in this case, the focal company exploits its power over first-tier suppliers, to make them monitor and manage their lower-tier suppliers. Basically, first-tier suppliers when adopting indirect approach play a pivotal role in diffusing sustainability, hence they perform a secondary agency role as described in Wilhelm et al. (2016a). When first-tier suppliers meet themselves the sustainability requirement, they are fulfilling their primary agency role; when instead, they act on behalf of their principal to cascade sustainability they perform their second agency role, and this is the case of the indirect approach. There is evidence that first tier can be effective in diffusing sustainability requirements upstream in the supply chain. The indirect approach has two main benefits: first-tier suppliers know more information about lower-tier suppliers than buyers and may also be able to understand their sustainability challenges better (Wilhelm & Villena, 2021). This approach is considered hybrid as the focal company uses both its own resources and external resources to manage their sub suppliers (Meinlschmidt et al., 2018). Also in this

case, the authors identify two different approaches within the category of indirect governance mechanisms: multiplier-based and compliance-based (Table 11).

1. Multiplier-based approach

This approach is particularly effective, as advantages are identified for both parties, the direct suppliers and the distant tiers. Focal firms manage their direct suppliers in sustainability-oriented projects, and in turn these suppliers commit to manage their own suppliers with the same standards. A "multiplier effect" is thus generated throughout the supply network, and this ensures compliance with social and environmental standards among lower-tier suppliers.

2. Compliance-based

This approach requires a tighter control from the focal company. The aim is to let all direct suppliers via regulative instruments to evaluate, select and develop their own suppliers. Focal firms demand direct suppliers to apply sustainability initiatives often in their supplier's Code of Conduct. These compliance-based instruments are not very effective though, since often firms admit they do not control in a strict manner whether their direct supplier really applies these initiatives to sub-suppliers, they include the passage in supplier Code of Conduct in a symbolic way, just to have a reactive assurance in case of possible accusations. Thus, without enforcement, this approach is highly ineffective and may lead to "greenwashing".

Table 11. Classification of indirect governance mechanism

Indirect approach	Multiplier-based approach	Focal firms manage their direct suppliers throughout sustainability projects, who then commit to applying the same standards to their own suppliers generating a "multiplier effect"
	Compliance-based approach	The goal is to have direct suppliers use regulations to evaluate, select, and develop their own suppliers.

As indirect method is a less resource-intensive mechanism, it is likely to be implemented but may be less effective. As previously mentioned, IKEA partially adopts a direct approach in managing its supply chain. However, when it comes to sustainability

requirements, it takes an indirect approach, as it is the first-tier suppliers who are responsible for passing them down to the lower-tier suppliers (Jia et al., 2019). With some lower-tier suppliers, there is evidence of an indirect approach also in the case study conducted by Gong et al. (2023): in fact, some second-tier suppliers of IKEA pass sustainable cotton information and requirements to lower tiers. Focusing on the governance mechanism strategy, also Wilhelm et al. (2016b) provide evidence of the indirect approach. One of the companies analysed, operating in the food industry, formulated its own sustainability code made by 11 indicators focusing on both social and environmental issues: the code contains both mandatory and highly recommended practices, and it is in general a sustainable agricultural code. Given their large supply base, they are largely dependent on their first-tier suppliers: the company provides trainings about their code and guidelines to first-tier suppliers and delegates to them the monitoring of lower-tier suppliers through audits. The second company analysed, again within the food industry, communicates sustainability targets to first tier, but it is first tier itself that audits second-tier suppliers and involves them in sustainability initiatives. The last company, in electronics industry, has a similar strategy compared to the company in apparel industry: responsibility of managing lower-tier suppliers in this case is an audit criterion for first-tier suppliers. The indirect mechanism is largely evident also in another work of the same authors. In this study, Wilhelm et al. (2016a) explore the role of first-tier suppliers in the achievement of sustainability diffusion in the supply chains. The authors explore the primary and secondary agency role of first-tier suppliers. The results highlight the importance for focal companies to reduce information asymmetries at lower tiers level. In one supply chain examined there is evidence of indirect method: the first-tier supplier in this case is active in sustainability diffusion and it is a link between the focal company and lower tiers. The focal company audits once per year the first-tier supplier, and the first-tier supplier audits through visits the compliance of lower tiers with targeted sustainability indicators given by the focal company. In this precise case, first tier is made accountable for irregularities from their suppliers. Evidence of indirect approach in the papers selected are summarised in Table 12.

Table 12. Evidence of indirect approach in the papers analysed

Indirect approach	Monitoring via first-tier suppliers	First-tier suppliers are responsible for passing sustainability requirements to lower tiers.	Jia et al., (2019)
		Second-tier suppliers pass sustainability information and requirements to lower-tier suppliers.	Gong et al. (2023)
		Focal company delegates the monitoring through audits of lower-tier suppliers to first-tier suppliers.	Wilhelm et al. (2016b)
		First tier audits second-tier suppliers and involve them in sustainability initiatives.	Wilhelm et al. (2016b)
		The management of lower-tier suppliers is an audit criterion for first-tier suppliers.	Wilhelm et al. (2016b)
		First-tier suppliers audit through visits the compliance of lower tiers with targeted sustainability indicators.	Wilhelm et al., (2016a)

5.2.3 Work with third parties

Working with third parties mean that "focal companies collaborate with or delegate responsibilities to other organisations to manage sustainability across the supply chain" (Tachizawa & Wong, 2014). These external organizations could be NGOs, competitors, companies from the same industry, standards institutions. More specifically, coalitions with competitors and other industries can be implemented to gain power over suppliers. In Meinlschmidt et al. (2018), this approach is defined as "alliance-based". In this case buying firms are active members of sustainability-related alliances or industry consortia. This membership enables companies to better ensure sustainability initiatives at lower levels of the supply chain, as these alliances use independent providers to ensure compliance at sites or make it possible to exchange audit information of lower-tier supplier. This approach is effective, as lower-tier suppliers' compliance is achieved thanks to independent audits provided by industry standards. Even though focal firms in this case "outsource" this responsibility, it is important that they provide inputs to third parties and that they oversight their effectiveness. An example of this mechanisms provided in Tachizawa & Wong (2014) is Walmart's alliance with Unilever: the cooperation was aimed at obtaining more power against a critical palm oil's supplier. An important feature is that firm can benefit of NGO's environmental and social databases to monitor sub-suppliers. Also, transaction costs must be considered when evaluating the

efficiency of this approach: even if there is not a commercial relationship with the third party, search, information and bargaining costs may be necessary.

Jia et al. (2019) provide evidence of IKEA using a third-party called BCI (Better Cotton Initiative) and of Nestlè creating a platform called "Dairy farming institute" with the help of business and academic partners, in order to provide trainings to dairy suppliers. The implementation of BCI global platform by IKEA is also mentioned in Gong et al. (2023). Moreover, in the case study of Wilhelm et al. (2016b), one of the companies analysed introduced the Rainforest Alliance certification, a global organization that certifies suppliers' sustainability compliance, and requires suppliers to comply with its standards. Thus, the focal company performs an assessment of lower tiers through a third-party organization. Tachizawa & Wong (2014) also claim that focal firms can use NGOs' environmental and social DBs to monitor lower tiers. Third parties can be used also for auditing, in Gong et al. (2023) IKEA collaborates with an international auditing company for energy usage. The practice of co-working with third parties is also largely explored in the work of Marttinen et al. (2023). The authors claim that among the imposed governance mechanisms, third party certification requirements are the most common practice: sustainability-related third-party certifications are largely used to evaluate suppliers. Indeed, the firm can request sustainability-related third-party certifications and standards (e.g. ISO14000) from their suppliers. A focal company can require it to direct suppliers, but in general also first-tier suppliers can require them to lower tiers: generally, this practice was reported in the study by all focal firms, all first-tier suppliers and all lower-tier suppliers analysed. The study provides evidence of a focal company cascading sustainability requirements down its supply chain by demanding that lower-tier suppliers obtain the same certifications the company holds. Not only standards and third-party certifications but also alliance with competitors emerge in the analysed literature as a "work with third party" method, as previously mentioned. In the work of Villena & Gioia (2018) it is mentioned that industry organizations positively affect the cascading of sustainability requirements: from their study, it is stated that in the electronics industry several brands collaborate closely with competitors and can disseminate and develop industry-wide standards and requirements. Suppliers may have multiple customers asking for the same requirements (e.g. standardised self-assessment), and this will make them more willing to participate. Results from the papers are summarised in Table 13.

Table 13. Evidence of "work with third parties" approach in the papers analysed

Work with third party	Collaborating with NGOs	Focal company uses a third party (BCI) which registers sustainable cotton suppliers, and it is aimed at making cotton production better from both an environmental and social perspective.	Jia et al. (2019) Gong et al. (2023)
		Focal firm uses NGO environmental and social DBs to monitor lower tiers.	Tachizawa & Wong (2014)
	Collaborating with external stakeholders	Focal company created a platform with business and academic partners to provide trainings to suppliers.	Jia et al., (2019)
	Alliance with competitors	Focal company collaborates with competitors to spread sustainability standards in the industry.	Villena & Gioia, (2018)
	Third-party auditing	Focal company collaborates with an international auditing company to audit energy usage.	Gong et al. (2023)
	Third party certifications and standards	Focal company requires proof of sustainability-related third-party certification, general or industry-specific labels and specified management systems (e.g. ISO standards).	Marttinen et al. (2023)
		Focal company introduces Rainforest Alliance certification.	Wilhelm et al. (2016b)

5.2.4 Don't bother approach

According to the "don't bother approach", "focal companies focus on first-tier suppliers and have neither information about lower-tier suppliers nor intention to influence them" (Tachizawa & Wong, 2014). The firm does not engage in interactions beyond tier-one suppliers. This approach may be implemented when there is scarce information regarding lower-tier suppliers, and when firms have limited power in the supply chain or limited resources to monitor suppliers. Of course, this is very risky, as the probability of being involved in social or environmental scandals increases substantially. In fact, lower tiers suppliers happen to be the ones that generates the most severe and impactful social and environmental risks. This approach is also referred to as the "neglect approach" (Meinlschmidt et al., 2018).

Marttinen et al. (2023) conclude that governance mechanisms are primarily focused on the immediate supply chain tiers, confirming that focal companies often establish a direct

relationship just with first-tier suppliers (i.e. “don’t bother approach”), or delegate the responsibility of ensuring sustainability in lower tiers to their direct suppliers (i.e. indirect approach). Nevertheless, to achieve effective multi-tier sustainable supply chain management, it is crucial for firms to extend their efforts beyond direct suppliers and implement a broader range of governance mechanisms. To sum up, the study shows that the use of governance mechanisms beyond the immediate supply chain tier is still limited. Often companies realize the importance of multi-tier sustainable supply chain management but lack the resources, the influence and tools to do so. Overall, compared to other governance mechanisms, direct approach is the most risk-adverse, as the control over suppliers is strict. The lack of a direct mechanism, in which the focal company has a direct influence on suppliers, can hinder the possibility of reaching sustainability standards upstream in the supply chain (Gruchmann, 2022).

To some extent, this section has shifted away from the concept of power, as it mainly focused on governance mechanisms within multi-tier supply chains. Although the role of power in influencing the adoption of different governance mechanisms is explored by some authors (Marttinen et al., 2023; Tachizawa & Wong, 2014; Wilhelm et al., 2016b), the connection between power and governance mechanisms is not clearly explored in the literature analysed. Power is one of the contingency variables identified by Tachizawa & Wong (2014), and also Wilhelm et al. (2016) mention power asymmetries as one of the contingency variables for managing sustainability in multi-tier supply chain, describing instances in which differences in power between buyer and suppliers are present. In general, it is found that firms may use their power over direct suppliers to make them monitor lower-tiers suppliers, and thus buyer power enhances the possibility for a firm to implement sustainability practices in its supply chain (Hoejmose et al., 2013; Tachizawa & Wong, 2014). Moreover, “don’t bother” approach is said to be used by firms with limited power in the supply chain: when power asymmetries favour first tier, it is likely that the buyer is not powerful enough to make its direct suppliers engaging in the management of lower tiers (Tachizawa & Wong, 2014; Wilhelm et al., 2016b). Also, coalitions with competitors and organizations happen when the buying firm has little power toward its suppliers, and collaborating with competitors may succeed to influence common suppliers (Marttinen et al., 2023; Tachizawa & Wong, 2014). Firms that instead follow a direct approach tend to have more power (Tachizawa & Wong, 2014). Despite

these observations, power dynamics and governance mechanisms are mostly treated separately in the literature analysed, highlighting an important research gap.

Gong et al. (2023), when analysing IKEA's cotton supply chain, state that a limitation of the research is not to consider the role of power. Indeed, it is not explored how IKEA's power may have influenced the success of the sustainability initiative in the case study. Jia et al. (2019) claim that the concept of power does not cover all the dynamics that can verify when buyers manage its suppliers, and study supply chain leadership as a more appropriate construct. Nonetheless, authors state that the role of focal companies' power and its influence on the management of lower-tier suppliers require further study. Similarly, Marttinen & Kähkönen (2022) affirm that the role of power dynamics in affecting the implementation of governance mechanisms to diffuse sustainability in a multi-tier supply chain is under researched and could receive more attention in the future. Therefore, this classification highlights that the connection between power dynamics and governance mechanisms in the context of sustainability diffusion in multi-tier supply chains is an unexplored area, and further research is needed.

5.3 Types of power

According to Marttinen & Kähkönen (2022), power can be defined as "the ability of an actor to impose its will on others". Therefore, it can be interpreted as persuading a party to do something it would not have done otherwise. There are also alternative definitions useful to identify power, among the others the "ability of a party to exert control and influence over another party" (Wilhelm & Villena, 2021). When discussing about the spreading of sustainability initiatives over a multi-tier supply chain, power can be defined, according to Marttinen & Kähkönen (2022), as the "the ability to influence the actions of other supply chain actors in a way that facilitates them to push the entire multi-tier supply chain towards desired sustainability performance outcomes". In the context of multi-tier sustainable supply chains, power is considered a key variable in implementing and diffusing effectively environmental and socially responsible sustainability practices. This section is aimed at exploring how different types of power can facilitate the diffusion of sustainability practices within the supply chain.

Different types of powers can be involved in the process of diffusing sustainability initiatives in the supply network. Given that power asymmetries may arise in a supply network, a theme of central importance in the existing literature is how power can be enforced to implement sustainable initiatives in a company's supply chain, and which type of power is more influential. In the literature, the exertion of power presents a contrast: while for some authors the excessive use of power by influent buyers is considered unethical and unmoral (Marshall et al., 2019), some others claim that the diffusion of sustainability in the network is not possible without a certain degree of power exploitation (Hoejmose et al., 2013; Touboulic et al., 2014).

Generally, power can be exercised in a coercive or non-coercive manner: where the former may cause resistance among suppliers and adverse relationships, the latter is achieved in a more subtle and less disputed way (Meqdadi et al., 2019). Indeed, Raven (1959) provides a first typology of power, distinguishing among five power categories: coercive, expert, legitimate, referent and reward power. In this study, coercive power is defined as "the expectation on the part of P that he will be punished by O if he fails to conform to the influence attempt", and hence it is exercised through direct pressure on a party to perform a specific behaviour and it is mediated by the source (Raven, 1959).

Non-coercive power is instead defined by all the remaining types of power of the framework, and it is mostly a non-mediated form of power (Gruchmann, 2022; Meqdadi et al., 2017). Existing literature demonstrates that focal companies must be in a position of power to successfully cascade sustainability initiatives to their lower-tier suppliers. Overall, a company which is in a position of power has more chances to successfully influence suppliers to comply with sustainability requirements. Nonetheless, the use of coercion is risky as it can lead to adversity and conflicts, and thus also trust and cooperation in buyer-supplier relationships are needed (Meqdadi et al., 2017).

Based on findings of existing literature, types of power have been analysed as coercive versus non-coercive (with coercive encompassing all types of power other than coercive – referent, expert, legitimate, reward) as explained in Meqdadi et al. (2019). Moreover, the different types of power identified can be grouped in mediated and non-mediated power (Benton & Maloni, 2005). According to Marshall et al. (2019), non-mediated power is regarded as positive and it is an "indirect form of power embedded in the relationship" – and it includes expert and referent power – while mediated power "entails the direct action of a party to another" and it includes coercive, legitimate and reward power. Nonetheless, for this literature review, an alternative perspective has been adopted – aligned with Gruchmann (2022). According to the author, mediated power includes reward and coercive power while non-mediated power includes referent, expert and legitimate power. This further classification is depicted in Figure 19.

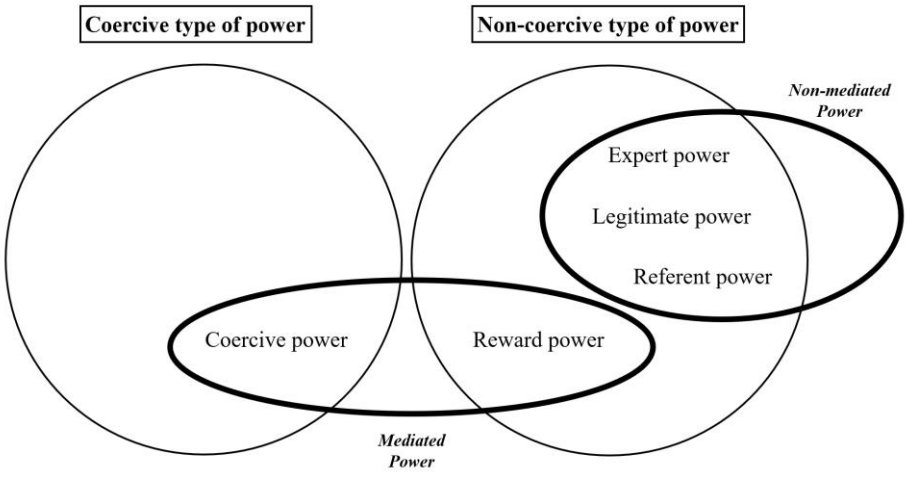

Figure 19. Classification of types of power

As anticipated, the existing framework by Raven (1959) has been used to analyse selected papers. Coercive power is implemented with threats and punishments, from one party to another one which is usually weaker. Pressure is made so that non-compliance leads to adverse consequences for the weaker party. An example of this dynamic is threatening to end a contract relationship with a supplier, as well as significantly reducing the volumes purchased whenever sustainability initiatives are not correctly implemented or if sustainability requirements are not met. Expert power is the power asymmetry generated when one party has more knowledge or expertise compared to the other, and thus it can provide valuable competencies. When a party shows strong admiration for another party's practices and values, referent power is present. This dynamic can result in an adoption or mimic of practices from the weaker party: in this case, the buyer tries to convince supplier to embrace and mirror its values. Moreover, the weaker party wants to learn from the other and sees it as a model to emulate due to its position. Legitimate power is exercised through structural and legal authority: this form of power verifies when one party exercises control on another party, authorized by legal principles and institutions. Lastly, reward power is based on promising rewards to the weaker party for certain actions, e.g. purchasing more volumes from the companies that perform better in terms of sustainability. All the mentioned types of power can be used as an instrument to spread sustainability best-practices in the supply chain.

Meqdadi et al. (2017), through a case study that analyses the diffusion of a sustainability initiative in the biochemical industry, affirm that both coercive and non-coercive power impact the likelihood of spreading the sustainability initiative in the broader supply network. In detail, coercive power influences the decision of suppliers to both adopt and diffuse sustainability initiatives, but it is non-coercive power that represents a pivotal factor in their decision to spread sustainability in the lower tiers of the network. The authors stress the importance of trust to facilitate the implementation and the diffusion of sustainability initiatives, and there is evidence that non-coercive power combines better with trust comparing to coercive power. According to the authors, low commitment of the buyer in the buyer-supplier relationship and conflictual interactions are example of coercive power. Trust is positively related to non-coercive power, while it is negatively related to coercive power. In the case study, there is evidence of coercive power as it is stated that suppliers are afraid of ending the relationship with the focal company, but this

is true only with suppliers that have a weaker role in the relationship. Non-coercive power instead is found in the case study when the focal company assumes the role of sustainability leader and suppliers perceive the proposed initiative as an opportunity to gain expertise on sustainable products of the focal company. Indeed, this is clear evidence of expert power. Overall, the findings show that, even if coercive power has an influence in engaging suppliers to spread the sustainability initiative, non-coercive power is the most impactful and effective in the long term.

Aiming to research the impact of power on sustainability diffusion in a supply network, Meqdadi et al. (2019) further analysed four case studies within comparable industries, with each case study focusing on a focal company and its set of suppliers. Although the companies analysed by the authors are based in Europe, they all have a global supply network. Information and data were gathered mainly by interviews with informants of both suppliers and the four focal companies. From the analysis of the four case studies, several forms of coercive and non-coercive power emerge. By analysing the four buyer-supplier relationships it can be identified how power presents in the previously defined types. Coercive power can be found in pressure to participate in sustainability initiatives and in setting minimum requirements, whose non-compliance may lead to termination of business. It is usually present when one party is severely dependent on the other, or significantly weaker. As regard reward power, some companies have a rewarding system, which makes it possible to prioritize high performing suppliers by giving them special treatments. As the companies analysed have a strong position in the industry and are perceived as legitimated to request sustainability requirements, there is also evidence of legitimate power. The focal company in this case has legal and structural authority to demand for requirements. Expert power happens when the focal company has the resources to provide guidance to suppliers when dealing with sustainability, that could be for example in the form of training or by sharing information. In this case the focal company offers to share knowledge and expertise to its suppliers. When following the sustainability programs initiated by the focal company was perceived as a way to attract more customers and to build reputation, referent power was present: suppliers in this case try to exploit focal company's position in the market. The supplier in this case put efforts to mimic buyer's practices and values. Of course, just in some cases the previously mentioned mechanisms of power happened to be successful in spreading sustainability.

Nonetheless, there is evidence in the study that power influences the diffusion of sustainability initiatives. The main result of this study is the following: although coercive power is the only form of power being present in all the four case studies, there is evidence that using just this form of power helps diffusing initiatives to first tier but not to the upstream supply chain. Basically, by using coercive power without combining it with non-coercive one (e.g. expert, referent, legitimate, reward), sustainability diffuses to first-tier suppliers only. On the contrary non-coercive forms of power help the diffusion of sustainable practices beyond first tier, in the broader supply network, and thus it revealed to be more effective as it is shown in Figure 20.

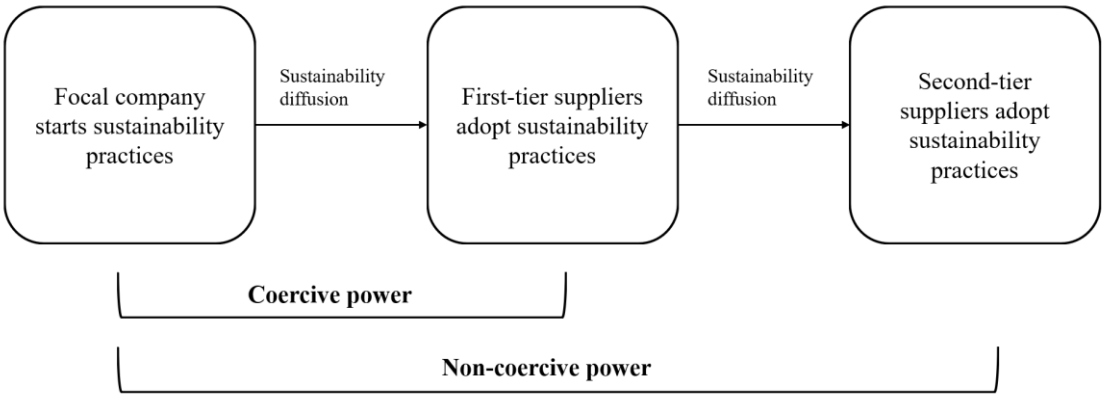

Figure 20. Diffusion of sustainability initiatives (Adapted from Meqdadi et al., 2019)

The reason why coercive power is not useful to reach lower tiers can be found in the fact that it can hinder collaboration, resulting in suppliers' dissatisfaction due to pressure and threats. In this context, suppliers do not feel the need to diffuse requirements to their own sub-suppliers. Coexistence of coercive and non-coercive power instead diffuses sustainability beyond dyadic level. Indeed, an excessive use of coercive power alone might be even counterproductive (Wilhelm & Villena, 2021).

A similar result is observed in the work of Marshall et al. (2019) where mechanisms to facilitate the adoption of sustainable procurement practices are explored. It is found concordantly that non-coercive power, and in particular non-mediated power, fosters the adoption of sustainable procurement practices. More specifically, the authors find that expert and referent power foster the adoption of socially responsible procurement

practices by first-tier suppliers. Specifically, the authors take a step forward by analysing the impact of buyer's power on first-tier suppliers' adoption of socially responsible procurement practices with their own sub-suppliers. In particular, the focus of the study is on analysing both the influence of mediated and non-mediated power on the adoption of these practices. Marshall et al. (2019) evidence how some companies adopt a questionable coercive approach (i.e. mediated) with their lower tier suppliers, which can be seen as a "bully" behaviour towards suppliers, and it is due to a significant imbalance of power. Some others, instead, adopt a collaborative approach based on trust and sharing of information. In this context, the authors highlight the importance of power exerted on first-tier suppliers, as they have a pivotal role in cascading sustainable procurement practices, and they define them as the "piggy in the middle" due to their position in the middle between focal companies and lower-tier suppliers. This central role of first-tier suppliers is also present in Touboulic et al. (2014): the role of first tier is crucial in ensuring the propagation of sustainability with second-tier suppliers. First-tier suppliers, it is mentioned, represent a strategic link with the large company, and are connected to a lot of parties in the supply network. Furthermore, Marshall et al. (2019) question how types of power affect the success of cascading socially responsible initiatives to first-tier suppliers, and whether they are willing to diffuse them to their own suppliers. Since environmental practices are widely standardized and implemented, this study focuses on socially responsible procurement practices, which according to the authors are less explored. In fact, the "environmental" component of ESG is highly discussed in the literature, while "social" and "governance" are less examined. The authors distinguish between process-based and market-based socially responsible practices. Process-based procurement can be also defined as "socially responsible purchasing". These practices "involve companies monitoring their suppliers' socially responsible practices and ensuring that they minimize negative impacts of industrial processes, usually through health and safety compliance" (Marshall et al., 2019). The supplier must use in this case a socially responsible management system. Market-based practices focus on innovation in both product and processes: "these practices involve working with suppliers to develop socially responsible procurement practices beyond health and safety measures that will bring advantages to the stakeholders involved in the supply chain". In this case, a collaborative relationship is needed between buyers and suppliers and in some cases also third parties (e.g. NGOs or community groups) may be involved in the process. The main

result of this study is that non-mediated power, intended specifically as expert and referent, has a positive impact in spreading both process-based and market-based socially responsible procurement practices, as it is shown in Figure 21. Suppliers will be open to enhance their practices if buyers are willing to provide expertise, trainings, shared values and orientation towards sustainability. On the other hand, mediated power use, and specifically coercive type, has proved to be useless for the adoption of both those kinds of practices. In fact, suppliers will not implement sustainability program when they are forced or when surveillance is too strict. This is particularly true for market-based practices, where collaboration is crucial to spread innovation and new technologies.

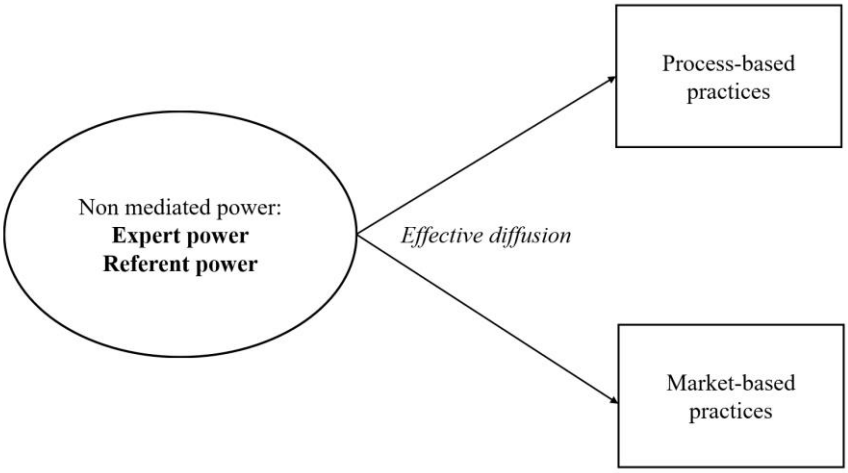

Figure 21. Influence of power in the diffusion of socially responsible procurement practices (adapted from Marshall et al., 2019)

A similar result is reached in Gruchmann (2022): the study shows a positive correlation between non-mediated power and sustainability performance. Indeed, the use of moderate coercive power can facilitate sustainability diffusion up to a certain extent, then it is indeed ineffective. There is evidence of an inverted U-shaped relationship between the use of mediated power – more specifically, coercive – and sustainability performance with both high and low centrality in the supply chain (Figure 22). Thus, the authors claim that there exists a positive relationship between non-mediated forms of power and sustainability performance, while there are potential negative effects when using only mediated forms of power. Power asymmetry and more specifically coercive power spreads sustainability diffusion to a certain extent, up to a point where the opposite result

is obtained and so there is the need to integrate mediated power with non-mediated forms of power.

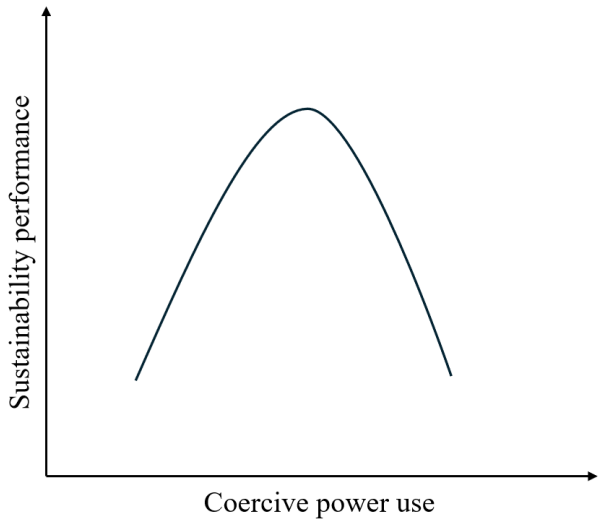

Figure 22. Influence of coercive power use in sustainability performance (adapted from Gruchmann, 2022)

In addition, also Touboulic et. al (2014) provide contributions to these themes. The authors explore the influence of power in achieving sustainability goals, highlighting that different forms of power can support or hinder sustainable practices in the supply chain. Efforts to cascade practices to suppliers will be ineffective if firms use coercive power, as it will result in no sustainability gains and most likely in a waste of time outcome. In the study, a case approach is adopted: a single leading company relationship with direct and indirect agricultural suppliers is analysed. From the study it emerges that even if a situation of power imbalance makes it possible for the buyer to enforce sustainability requirements with suppliers, the only use of coercive power is effective in achieving compliance just with minimum requirements, as suppliers will not commit properly. Coercive power can be found, as mentioned in the study, in the impossibility for the supplier to enter into long-term relationships, in tough contractual arrangements and in one-way communication. Also, lack of involvement of suppliers is present when defining sustainability goals, and strict monitoring is adopted. In this context of coercion, buyers try to adapt to more stringent requirements only as they fear the end of the business relationship with the buyer. It is mentioned that suppliers struggle to comply with buyers'

sustainability requirements and feel there is no recognition from the buyer side for the efforts made towards sustainability compliance. This situation results in a failure to establishing cooperation and a mutual relationship between supplier and buyer, thus hindering the diffusion of sustainability.

Wilhelm et al. (2016a) explore under which conditions not only first-tier suppliers comply with sustainability initiatives themselves, but also diffuse them to their own suppliers (referred by the authors as "coupling primary and secondary agency role"). Authors find out that when non-mediated power is used, there is less risk of "decoupling", which is intended as a situation in which first-tier suppliers manage to comply with sustainability requirements but fail in cascading them to lower tiers. The results of the study are consistent with the ones of Meqdadi et al. (2019): suppliers, when only mediated power – specifically coercive – is used, are more likely to comply with sustainability initiatives, but they do not spread them broader in the upstream network.

Evidence of different types of power emerged from reviewed papers are summarised in Table 14.

Table 14. Evidence from studies highlighting the various types of power identified by Raven (1959)

Expert power	• Focal companies share information and expertise with suppliers. • Collaborating with buyer is an opportunity for suppliers to gain knowledge on sustainability.
Referent power	• Suppliers gain reputation in the market by associating with focal companies. • Suppliers share values with the focal company.
Coercive power	• Sustainability as a minimum business requirement. • Direct pressure and threats to end business if sustainability requirements are not met. • Rely on monitoring tools, e.g. audits. • Low commitment of the buyer in buyer-supplier relationship. • Tough contractual terms, favouring the buyer. • One-way communication and no involvement of the supplier on the initiatives' development. • No consideration of suppliers' difficulty in engaging with sustainability.
Legitimate power	• Focal company is seen as a sustainability leader.
Reward power	• Special treatments and awards to high performing supplier, e.g. purchase of more volumes.

To conclude this section about different power types employed in the supply chain, it is to mention the work of Brockhaus et al. (2013): different companies from different industries were interviewed for this study. Authors propose a typology to classify supply chain approaches toward sustainability: a mandated and collaborative focus toward sustainability spreading in supply chain are identified. When the sustainability initiatives are proposed and spread by the buyer to the lower tiers, the focus is on mandated initiatives. These mandated sustainability initiatives are implemented through a mediated form of power: the buyer, that happens to be more powerful, leads the initiative as a "pull process", and there is no two-way communication nor involvement of the supplier. This could be found, for example, in Code of Conducts signed by a supplier to enter a business relationship with the stronger buyer. As previously found by Meqdadi et al. (2019), this type of cooperation is dyadic, and it is not able to involve suppliers in lower tiers of the supply chain. Mandated sustainability initiatives are characterized by lack of communication and collaboration and short-term relationships with suppliers, not focused on obtaining a long-term competitive advantage of which also the suppliers could benefit. In fact, it is the buyer that benefits mostly from the sustainability initiative, for the suppliers it is more of a requirement that must be met. On the other hand, the authors propose "collaborative" supply chain sustainability initiatives, which are characterized by high degree of trust and cooperation, with a long-term perspective. The aim here is, in fact, to obtain a strong and long-term competitive advantage through sustainability. There is evidence that these types of initiatives are readily accepted by suppliers, who are in this way directly involved. Mandated and collaborative sustainability initiatives are summarised in Figure 23.

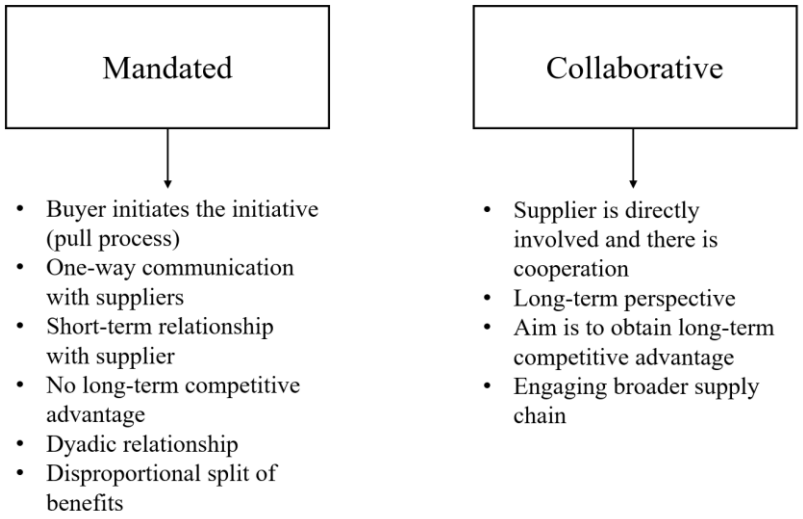

Figure 23. Mandated and Collaborative initiatives (adapted from Brockhaus et al., 2013)

The key findings from the papers analysed under the category "types of power", are summarized in Table 15.

Table 15. Main results regarding the influence of power types in sustainability diffusion

Results	Sources
Coercive power alone can help diffusing initiatives to first tier, while non-coercive forms of power help the diffusion beyond dyadic level.	Meqdadi et al., 2019 Meqdadi et al., 2017 Brockhaus et al., 2013
Non-mediated power has a positive impact in spreading socially responsible procurement practices from first tier to sub-suppliers, while mediated power alone is useless.	Marshall et al., 2019
The only use of coercive power spreads sustainability up to a certain extent, then performance lowers and there is the need to integrate it with non-mediated forms of power.	Gruchmann, 2022
The only use of coercive power is effective for the compliance with minimum sustainability requirements, but suppliers will not commit properly, and it might be counterproductive.	Touboulic et al., 2014 Wilhelm & Villena, 2021
Sustainability initiatives implemented through a mediated or coercive form of power do not diffuse in lower tiers, while collaborative sustainability initiatives engage in the broader supply chain.	Brockhaus et al., 2013
There are less risks of decoupling the double agency role of suppliers when non-mediated power is used.	Wilhelm et al., 2016
Coercive power influences the decision of suppliers to both adopt and diffuse sustainability initiatives, but it is non-coercive power that is a key factor in their decision to spread sustainability in the network.	Meqdadi et al., 2017

Overall, the role of power in the supply chain is largely explored in the literature. Despite that, as it can be deduced by the limited number of papers, the different types of power are seldom explored in the context of sustainability diffusion in multi-tier supply chains. Few studies focus on how different types of power may help or hinder the diffusion of sustainability in multi-tier supply chains, much of the information presented was inferred from works which were not specifically addressing this topic, but rather imbalanced relationships in supply chain. In particular, the role of non-coercive power in sustainability diffusion is often neglected, while coercive power is mostly explored. Indeed, from the sample of papers, only the work of Marshall et al. (2019) – despite focusing only on the adoption of socially responsible procurement practices – provides examples and deeply explains all the types of non-coercive power. It can be thus stated that the role of non-coercive power may be further explored, studying non-coercive power from the perspective of its single components (i.e. reward, legitimate, expert and legitimate), rather than treating it as a single category.

5.4 Sources and Dynamics of power

The aim of this section is to identify the sources from which companies draw power and examine the conditions under which buyer or supplier dominance verifies. In Tachizawa & Wong (2014), power is depicted as one of the contingency variables that affects the management of sustainability in multi-tier supply chains. Power sources influence the ability and effectiveness of firms to spread sustainability lower in a multi-tier supply chain. There might be differences between suppliers and focal companies in the sources of their power, since sources of power change depending on different variables, including the position of the actor in the supply chain. This implies that there will be situations in which the power source favours the buyer, but also cases in which the supplier is dominant in the relationship. From the sample of papers analysed, 8 sources of power are identified. The identified sources of power may lead to buyer or supplier dominance. As Hoejmose et al. (2013) claim, buyer power results in supplier dependence, and it verifies when the relationship outcome is beneficial for the buyer, who appropriates for most of the benefits resulting from the exchange. On the contrary, the opposite situation favours the supplier, leading to supplier dominance. Furthermore, also a situation of interdependence is possible.

A major contribution on this topic is given by Marttinen & Kähkönen (2022), who classify sources of power into three categories: organisation, relationship and network. Organisation-level sources (e.g. firm resources and size) are internal to the single company. They are power sources that stem from firm-specific characteristics. Relationship-level sources include the dyadic relationship, power sources in this case are connected to dyads. Network-level are investigated in a multi-tier setting, e.g. actors' roles and position in the network.

In general, firms have the necessity to enter a relationship with other firms to access additional resources, as no self-sufficient organizations exist. Relationships are seldom balanced, as power sources can be contextualised in different circumstances. Power imbalance happens when the dominant organization influences the weaker party, and the weaker party complies with its requirements (Touboulic et al., 2014). In this dynamic, an organization is dependent on another but not vice versa (Hoejmose et al., 2013). In this context, power of the dominant organization sources from the fact that it has some key

resources from which the weaker party is dependent, and thus there is evidence of power asymmetry. According to Touboulic et al. (2014): “there will be power imbalance if firm A is more dependent on firm B than firm B is on A”. Authors state that the need for a unique resource increases the dependence of actors in the buyer-supplier relationship. In sum, power in the supply chain relationships depends on two key variables: criticality of the resource and number of resources available. Also, Gemente et al. (2024) state that control of the activities on the supply chain (and of coordination) is owned by the agent with the higher level of resources. Moreover, the imbalance of power may result in the asymmetric appropriation of benefits and risks that result from the exchange. Relationship power that originates from this dynamic is important as it can impact the willingness of members of the supply chain to spread sustainable initiatives in the broader supply network. Marttinen & Kähkönen (2022) state that the success of the sustainability initiatives in the supply chain is affected by the power relations between firms. Concerning the effectiveness of power asymmetries in diffusing sustainable supply chain practices, the existing literature is divided: while some authors claim that a powerful buyer is more likely to enforce sustainability requirements with its suppliers, some others see this coercive power an unmoral mechanism that ends up in bullying suppliers, hindering sharing of knowledge and collaboration, and hence not effective in the long run (Wilhelm & Villena, 2021). For Touboulic et al. (2014), although power imbalance can positively influence the diffusion of sustainability practices in the short term, in the long-term exploiting buyer power can happen to hinder the achievement of sustainability goals and create resistance among suppliers. Brockhaus et al. (2013) state that larger and more powerful focal companies initiate the effort toward sustainability and tend to benefit disproportionately from the initiatives’ outcome, using their influence on the less powerful supplier. In the study conducted by Grimm et al. (2014), buyer power is found to be one of the critical factors that enables direct suppliers to manage sub-suppliers and diffuse sustainability standards: if the focal firms have power, also first tier can set sustainability requirements more effectively. Gold et al. (2020) argue that imbalance of power in the supply chain influences sustainability standard diffusion. Wilhelm et al. (2016a) state that focal firms may struggle to diffuse sustainability initiatives upstream in the supply chain when power asymmetry favours suppliers.

Hoejmose et al. (2013) find that, although sustainable supply chain management is supported by the asymmetry of power in the network, also situation of mutual dependence can help to make supply chains more sustainable. Similar results are obtained also in the work of Sharma et al. (2023), in which it is claimed that the balance of power can influence the sustainability of the supply chain. In this paper the concept of power distribution in a dyadic supply chain is studied in the form of a Stackelberg game. The actors involved are a retailer (buyer) and a manufacturer (supplier). The study analyses the three situations: buyer with more power, retailer with more power and power symmetry (equal power). Likewise, in their work, Hoejmose et al. (2013) also consider power-dependency among two dimensions: power imbalance or asymmetric interdependence and joint or symmetric interdependence.

Thus, there can be three different power dynamics, as shown in Figure 24: buyer dominance, supplier dominance, and interdependence.

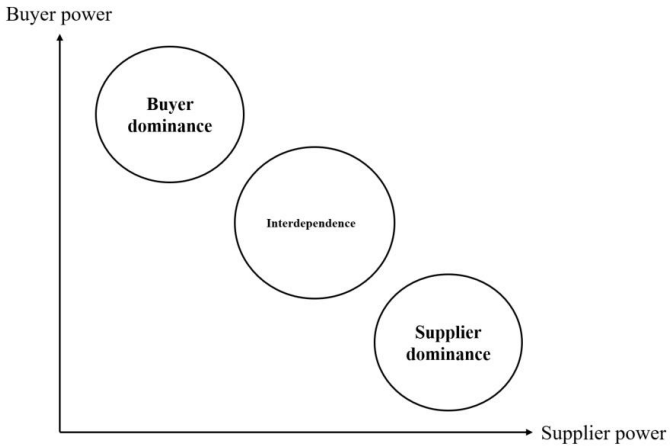

Figure 24. Possible buyer-supplier relationships

The identified sources of power are the following: (1) number of alternative buyers and suppliers, (2) criticality of resources, (3) purchasing volumes and revenues; (4) position in the network; (5) size of the company, (6) sustainability expertise and knowledge; and (7) market access. Definitions are given in the next paragraph, and are summarized in Table 16. The different sources of power that generate these three configurations of buyer-supplier relationship are now discussed and delved into. It is to highlight that the

source “market access” leads exclusively to buyer dominance. Also, interdependence is generated only by two sources – “sustainability expertise and knowledge” and “size of the company”.

Table 16. Definitions of power sources

Power source	Definition
Number of alternative buyers and suppliers	Concentration of buyers and suppliers in the market.
Criticality of resources	Degree to which a resource can be accessed and found in the market. The more a resource is critical, the more it will increase dependency.
Purchasing volumes and revenues	Purchasing volumes refer to the quantity purchased by the buyer from the supplier, while revenues are intended as income generated by the supplier from the relationship with the buyer.
Position in the network	Positional power is derived by the firm’s position in the network or by the role assumed by the company in the supply chain.
Size of the company	Perceived size compared to other supply chain actors.
Sustainability expertise and knowledge	Firm’s expertise and knowledge in the area of sustainability.
Market access	Ability of a company to enter a market.

5.4.1 Buyer dominance

1. Number of alternative buyers or suppliers

The concentration of buyers and suppliers in the market can lead to buyer or supplier power. Indeed, the availability of alternative supply options or alternative customers has an impact on the nature of the relationship.

In their study concerning the power relationship between a South African private healthcare provider and its suppliers, Schutte et al. (2022) provide proof that buyer power

verifies when the buyer has many suppliers to choose from. In this case study, a large number of alternatives is present for the buyer to supply from, and thus the supplier is not a key nor essential partner for the buyer. This situation is shown in Figure 25. In this case supplier power is low, as from the supplier's perspective the buyer is critical. Due to its position of power, buyer can end the relationship with supplier at any moment without incurring in additional costs, and hence it is also more powerful in requesting sustainability compliance to the supplier.

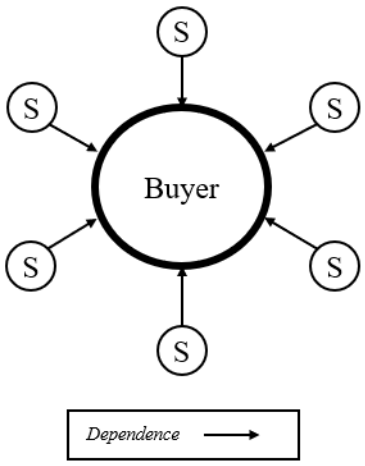

Figure 25. Situation of buyer power due to a large number of suppliers

Moreover, Touboulic et al. (2014), in their analysis of the UK food industry, find out that also when a supplier has lack of alternative buyers to supply its products to, the buyer has power. In the analysed case study, the supplier has no alternative buyer to supply its agricultural products to, and this leads to a situation of supplier dependence. The supplier in this case is highly dependent on the buyer to sell its products, as shown in Figure 26. Indeed, the buyer can highly influence the relationship as it is the primary customer: the supplier is economically dependent on the buyer since there is limited or no alternative buyers to sell the resource.

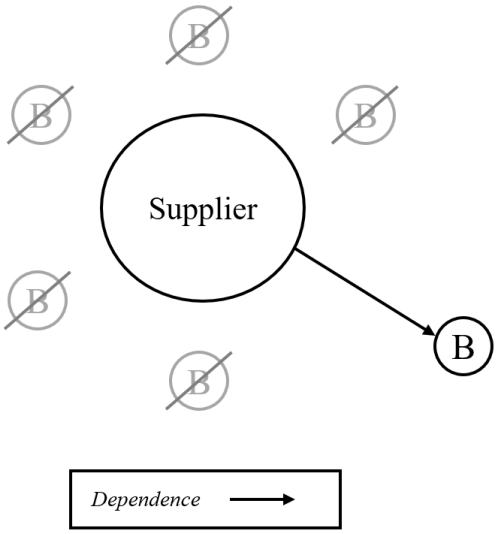

Figure 26. Situation of buyer power due to lack of alternative buyers

2. Criticality of resources

The criticality of a resource plays a significant role in shaping the dynamics of buyer-supplier relationships, as shown in Figure 27. When a resource is critical, it increases dependency and can shift the balance of power. If the resources supplied are commonly found and there is no criticality in supplying them, buyer is in a position of dominance. It may be that resources are not deemed critical to the buyer's strategic objectives and widely available. As stated in Schutte et al. (2022), buyer power happens when resources supplied are nor unique nor scarce and can be easily accessed. Hence, these resources have low commercial, operational and strategic importance for the buyer. In this case, "buyer power allows buyers to force suppliers to comply with the buying firm's supply chain sustainability standards before the suppliers can provide products or deliver services" (Schutte et al., 2022).

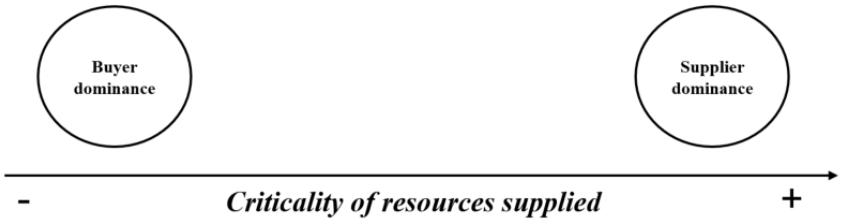

Figure 27. Influence of criticality of resources on buyer or supplier dominance

3. Purchasing volumes and revenues

Purchasing volumes and revenues or sales can shape the balance of power in buyer-supplier relationships. Purchasing volumes refer to the quantity purchased by the buyer from the supplier, while revenues are intended as income generated by the supplier from the relationship with the buyer.

A buyer is considered to be in a position of power when it purchases high volumes from a supplier, or if it represents a substantial proportion of supplier's sales. When the buyer purchases high volumes from the supplier, the latter cannot afford to lose the contract and thus buyer power is dominant in the relationship. Gold et al. (2020), when analysing the impact of network characteristics on the sustainability practices diffusion in the supply chain, find that buyers are more likely to pressure suppliers and sub-suppliers to adopt sustainability standards if the value of goods or services that they purchase represent a high proportion of the supplier's or sub-supplier's total business. Also, suppliers are more likely to comply with buyer's requests in terms of sustainability standards if the demanded volume by the buying firms is high. In one of the case studies analysed by Wilhelm et al. (2016a), there is evidence that power asymmetry in favour of the buyer can happen if the supplier is highly sales dependent on the lead firm. In the case firms analysed by Marttinen & Kähkönen (2022), one interviewed focal company affirms that it has benefited from their high purchasing volumes when influencing suppliers on sustainability. Moreover, also Wilhelm & Villena (2021) claim that the "cascading" of sustainability requirements in the broader supply chain always begins with a powerful buyer, and that buyer power over its suppliers is driven by supplier's dependency on sales.

4. Position in the network

Positional power is derived by the firm's position in the network or by the role assumed by the company in the supply chain. Indeed, positional power refers to the position that an actor covers in the supply chain and the amount of information that transits through it (Gruchmann, 2022). If a large amount of information transits through a specific actor, it is considered central and it is in a powerful position (Mena et al., 2013). Gruchmann (2022) claims that this dynamic can be referred to also as "network centrality", defined as the degree to which the power of decision-making is concentrated in a single company of the supply chain. Network centrality is positively related to the influence that a company has in cascading sustainability initiatives effectively to lower tiers (Gruchmann, 2022). In the work of Tachizawa & Wong (2014), this is cited as the ability to make connections in the supply network. Both focal companies and suppliers can be in a position of centrality in the network. Usually, focal companies and first-tier suppliers benefit from their position in the supply chain, but this is rarer when talking about lower-tier suppliers.

There is a situation of buyer dominance when the focal company occupies a central position in the supply network. In this context, the focal company may constitute a pivotal link between the upstream and downstream tiers of the supply chain, e.g. suppliers and customers. As Gold et al. (2020) state, network centrality is defined as the extent to which connectiveness is organized around a certain node within the network. According to the authors, network centrality can also be defined as the number of actors each actor of the supply network interacts with. It is stated that a highly central firm has more control over a supplier (in terms of governance mechanisms), and this makes it more difficult for suppliers not to comply with sustainability requirements and hide bad practices. Moreover, the buyer often assumes an intermediate position between the market and lower-tier suppliers, and thus it has more information than other agents in the supply chain (Gemente et al., 2024).

5. Size of the company

Marttinen & Kähkönen (2022) define size as the firm's "perceived size compared to other supply chain actors", as shown in Figure 28. In their work, size emerges to be crucial in the successful cascading of sustainability initiatives. While small companies face difficulties in making their suppliers adopt sustainability initiatives, large companies

happen to be more successful (Marttinen & Kähkönen, 2022). From the multiple case study, it emerges that often lower-tier suppliers are unable to diffuse sustainability to their own suppliers because of their small size. Also, Gold et al. (2020) state that small and medium-sized companies cannot exert sufficient power to influence suppliers when adopting sustainability initiatives. Lastly, also Tachizawa & Wong (2014) indicate size as a source of power. Size as a power source usually favours the buyer as it is more likely to be a large focal company.

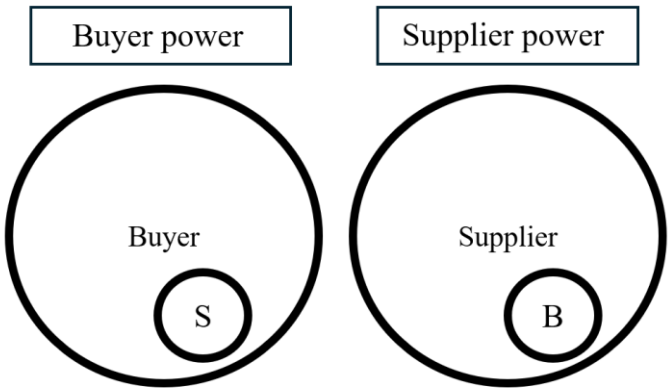

Figure 28. Buyer and supplier dependence based on size

6. Sustainability expertise and knowledge

In Marttinen & Kähkönen (2022), this source of power is defined as the "firm's expertise and knowledge in the area of sustainability". Also in this case, both the buyer and the supplier can derive power from this source. Through a relationship with a sustainability leader buyer, the supplier can gain precious knowledge on sustainability-related issues and practices. Meqdadi et al. (2017) evidence this dynamic: the focal company in the case study analysed is a sustainability leader in the market and has strong capabilities and expertise in developing sustainable products. The company in this case has the power to promote sustainability across its network thanks to its capabilities, as suppliers see it as a source of expertise and want to exploit its knowledge in sustainability area.

7. Market access

This source of power is the ability of a company to enter or serve a market, and there is evidence that it leads to buyer dominance. A firm with market power will exert its

influence in the market, as it has a large market share. In general, this is mostly a source of power which belongs to the buyer. If a company has a strong position in the market, it may be that for a supplier the buyer represents a possibility to access the final market (Figure 29), and thus it is a source of power for the buyer, which will be dominant in the relationship, and it will be able to influence the supplier towards sustainability initiatives. One of the case firms in Marttinen & Kähkönen (2022) claims that it is the "biggest actor in the market", and thus it is crucial for the supplier to access that specific market.

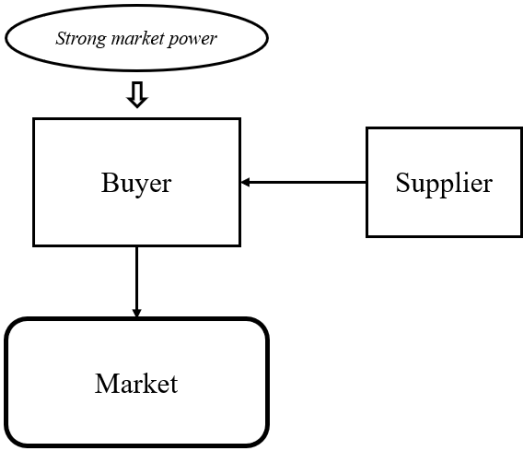

Figure 29. Influence of market power in the buyer-supplier relationship

5.4.2 Supplier dominance

1. Number of alternative buyers or suppliers

A large number of buyers favours the supplier, as depicted in Figure 30. A supplier is in a position of dominance if there are numerous buyers interested in the resources supplied.

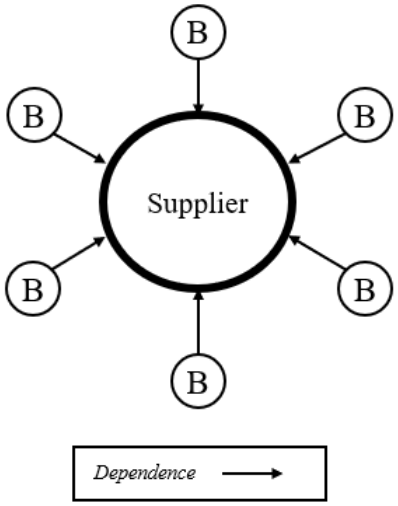

Figure 30. Situation of supplier power due to a large number of buyers

The supplier in this case provides a highly demanded resource, that many buyers want to access. In this context, if the supplier does not provide resources to a specific buyer, it has multiple other buyers to supply resources to. The large number of buyers allows the supplier to set favourable terms, as it is not reliant on any single buyer. Indeed, it is the supplier that can exit the relationship without severe consequences nor without incurring in additional costs (Touboulic et al., 2014): in the case study analysed, one of the suppliers has alternative buyers' options for its crop, and this is the source for a power asymmetry situation which favours the supplier. Hence, in this case it will be more difficult for the buyer to spread sustainability requirements, as it has not the power to do so.

2. Criticality of resources

If the resource supplied happens to be critical, the supplier is favoured. In particular, a supplier is in a position of dominance when the resource supplied is critical for the buyer's operations, or rarely accessible in the market. For instance, the supplier may provide niche products. There might also be situations in which the resources provided by the suppliers are key for the buyer's competitive advantage: in this case, the buyer's business heavily depends on the resource supplied and to find alternatives it would incur in additional costs. Touboulic et al. (2014) highlight that in their study there is a situation in which the large retailer has to rely severely on certain suppliers, as their crops are an indispensable

resource for its sustainability project (e.g. “healthy and sustainable product portfolio”). The supplier in this case is dominant as it knows its importance for the supplier.

3. Purchasing volumes and revenues

Supplier is powerful when the buyer represents a low proportion of its revenues or volumes. In this case, the supplier has power over the buyer as its revenues are diversified across multiple buyers: under these circumstances, losing one buyer does not significantly influence the supplier. Hoejmose et al. (2013), in their analysis of a sample of UK-based companies, study several dyadic buyer-supplier relationships: the authors state that if the buyer accounts for a small proportion of the supplier’s total sales, that specific contract may not be attractive for the supplier, thus the latter has a power advantage and the former do not have the influence to shape supplier’s sustainability practices. When the supplier is not highly sales dependent on the buyer, and thus there is lower power asymmetry, the supplier is able to negotiate with the buyer the sustainability requirements to be met and likely find a compromise (Wilhelm et al., 2016a). Among the companies analysed in Wilhelm et al. (2016a), there is one which refuses to comply to the firm-specific sustainability requirements as it has other clients to supply to, and hence it can afford to lose one specific buyer responsible for a small proportion of volumes or sales. Moreover, in the work of Marttinen & Kähkönen (2022), a focal company affirms it cannot afford to demand sustainability requirements as their purchase is an insignificant percentage of supplier’s whole production. This dynamic of power is illustrated in Figure 31.

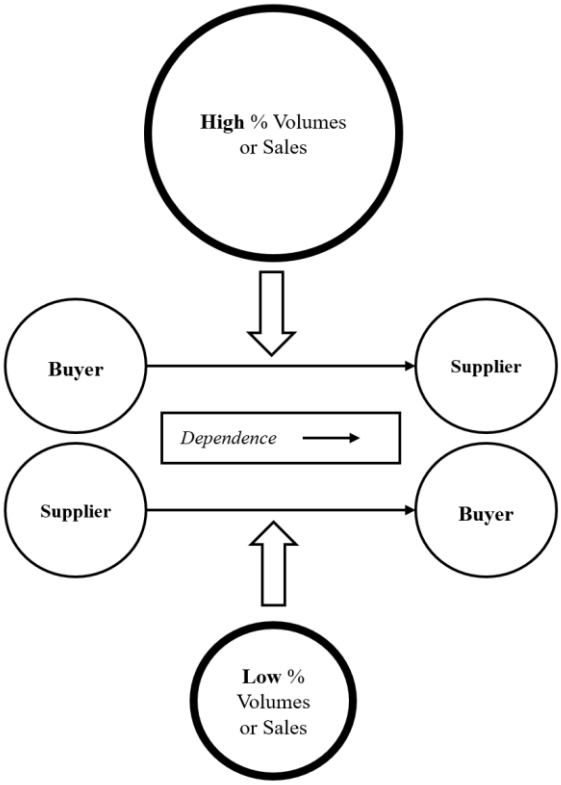

Figure 31. Supplier or buyer dependence depending on volumes or sales

4. Position in the network

Also the supplier can benefit from network centrality. Following the theory of nexus supplier, according to which direct suppliers assume a pivotal role in cascading sustainability standards, also the supplier can have more power due to network centrality: network asymmetries may arise from the supplier centrality in the supply chain and favour its position. In this context, supplier-subcontractor centrality is the number of actors each supplier interacts with, hence it can have an impact on power relationships (Gold et al., 2020). The supplier in this case plays a crucial role as it represents a bridge between buyers and sub-suppliers, and this gives it a position of power. The higher the supplier centrality, the less likely the standards will be adopted, as their diffusion is strictly connected to the actions of first-tier suppliers. Gold et al. (2020) highlight that the central position of the supplier in the network may hinder standards diffusion: in one of the industries analysed in the study the central position of the supplier creates resistance toward the standard diffusion, as the supplier gains power. Authors conclude that

suppliers with high network centrality may create network asymmetries, increasing their power in the supply network.

5. Size of the company

Despite this source usually favours the buyer (Gold et al., 2020; Tachizawa & Wong, 2014), in Marttinen & Kähkönen (2022) there is evidence of a focal company that deals with bigger suppliers compared to its own size, and this generates dependence of the buyer and affects collaboration with respect to supply chain sustainability. In the example, the buyer has a collaborative and more humble approach towards sustainability negotiation with the supplier, due to its smaller size. Thus, the power deriving from size can be generalised also in the case the supplier represents the larger company.

6. Sustainability expertise and knowledge

A supplier can provide a resource which requires special knowledge or own critical expertise related to sustainability, and thus it will gain power against the buyer. There is evidence of this dynamic in two of the cases analysed by Marttinen & Kähkönen (2022): two suppliers mention that being able to supply a critical or niche product that requires expertise helped them gaining power in the buyer-supplier relationship.

Table 17 summarizes the main results of buyer and supplier dominance, and provides papers from which information was gathered.

Table 17. Sources of power identified in the papers

Results	Sources
Number of alternative buyers or suppliers	Schutte et al. (2022) Touboulic et al. (2014)
Criticality of resources	Schutte et al. (2022) Touboulic et al. (2014)
Purchasing volumes and revenues	Gold et al. (2020) Wilhelm et al. (2016a) Marttinen & Kähkönen (2022) Wilhelm & Villena (2021) Hoejmose et al. (2013)
Position in the network	Gold et al. (2020) Mena et al. (2013) Gruchmann (2022) Tachizawa & Wong (2014) Gemente et al. (2024)
Size of the company	Marttinen & Kähkönen (2022) Tachizawa & Wong (2014) Gold et al. (2020)
Sustainability expertise and knowledge	Marttinen & Kähkönen (2022) Meqdadi et al. (2017)
Market access	Marttinen & Kähkönen (2022)

As a general result, Touboulic et al. (2014) confirm previous literature findings, according to which buyer dominance is effective in the initial implementation of sustainable supply chain management. Buyer power is an effective tool as it forces suppliers to comply with requirements. Without the pressure from the buyer, the small suppliers in the case study would not have attempted to meet sustainability minimum requirements. Nevertheless, a

situation of buyer dominance may also have a negative effect on the implementation of sustainable supply chain management. In fact, often suppliers do not benefit from the sustainability initiatives as much as the buyer does and this could ultimately resolve in an adverse relationship between buyer and supplier, as highlighted in the study. Authors also highlight that suppliers may develop resistance, and that a horizontal relationship between suppliers is likely to arise, which could counteract buyer power (Touboulic et al., 2014). Suppliers in this case resist against buyer power, and this can minimize the likelihood of spreading sustainability in the supply chain.

5.4.3 Interdependence

Power sources can also result in a situation of interdependence, and this may enhance cooperation. Indeed, there are cases where power sources are evenly distributed, leading to a situation of balance. In this context, both parties have resources that make them dependent on each other. This particular situation is also present in the literature analysed. The concept of interdependence is present in Touboulic et al. (2014). Interdependence inevitably implies a loss of power, but the gains are collaboration, preferential terms and share of knowledge that will increase the likelihood of sustainability initiatives to succeed. A similar situation is labelled as "joint dependence" in the work of Hoejmose et al. (2013). Joint dependence exists when both buyer and supplier rely on each other. In this case there is reliance on each other and the benefits which result from the relationship are equally distributed. Moreover, not only the benefits but also the risk of not being compliant with sustainable supply chain management is shared.

In the case analysed by Touboulic et al. (2014), the large retailer is reliant on the suppliers as they are the party that has to improve sustainability indicators directly, thus the supplier is key to implement sustainability targets, and this reduces buyer power. Also, the buyer's expertise and knowledge in sustainability matter is a valuable resource for the supplier to access the market, and thus this decreases supplier's power. Hence, both supplier and buyer in this case draw power from the power source defined as "sustainability expertise and knowledge": complementing with each other, a balanced relationship is created. As a result, suppliers are open to enter long-term agreements, and this implies a price advantage for them in change of their commitment. Also, there is similar evidence with power source "size" in the work of Marttinen & Kähkönen (2022), where one of the

companies of their study explains that when working with a supplier of similar size, power balance is created. Power balance derived from an equal size fosters collaboration and co-working.

To conclude, an important result is achieved in the study of Hoejmose et al. (2013): jointly dependence relationship, i.e. power symmetries, helps the implementation of sustainable supply chain management: indeed, these kinds of relationships are positively associated with the realization of socially responsible practices. The results are summarized in Table 18.

Table 18. Evidence of power symmetry in the papers analysed

Power source	Balanced relationship	Source	Benefits of power symmetry
Sustainability expertise and knowledge	Buyer and supplier rely on each other's sustainability knowledge and expertise	Touboulic et al. (2014)	• Collaboration and share of knowledge. • Long term agreements and long-term relationship orientation. • Benefits and risks of sustainability initiatives are equally distributed.
Size of the company	Buyer and supplier are equal in size	Marttinen & Kähkönen (2022)	

From Section 5.4 it can be concluded that power stems from different sources, and understanding them can provide precious insights to understand power use and power dynamics (Marttinen & Kähkönen, 2022). Although power sources have been largely studied in Sustainable Supply chain Management field, the existing literature lacks a specific focus on how power sources influence the ability of firms to cascade sustainability requirements throughout multi-tier supply chains. In fact, only Marttinen & Kähkönen (2022) address this topic. According to Marttinen & Kähkönen (2022), further analysis is also needed to explore how network relationships affect the diffusion of sustainability in lower tiers of supply chains.

5.5 Active and Passive Firms

The distinction between active and passive roles in sustainability efforts within supply networks is crucial for understanding how firms can either drive or hinder progress towards a more sustainable supply chain. A firm is active when it possesses "the ability to impose its will on others" (Marttinen & Kähkönen, 2022). This enables the firm to influence decision-making and actions of the other party, and to initiate sustainability initiatives. This dynamic describes all the situations in which the pressure for sustainability along the supply network yields successful outcome. On the contrary a firm is passive when it "could or would not respond to, or initiate, an action to address sustainability problems" (Villena & Gioia, 2018). In this case, pressures for sustainability along the supply chain yield unsuccessful outcomes. The analysis of the literature reveals situations in which firms exhibit both active and passive behaviours in the spreading of sustainability. Various factors that contributed to firms adopting either active or passive roles were identified in the papers selected and will be described in this section.

5.5.1 Active Firms

Focal company may start sustainability initiatives in a proactive way, as first and lower-tier suppliers often have limited resources and lower stakeholders' pressure. In doing this, there are some conditions under which the first-tier supplier will be able to pass the sustainability standards of its own customer (the focal firm) to the next tier. If the focal company engages its first-tier supplier in its sustainability initiatives, it can be defined as active (Villena & Gioia, 2018). In this context, first-tier suppliers have a pivotal role, as they can both comply with sustainability requirements and pass them in the upstream supply chain. Indeed, tier-one suppliers perform the so called "double agency role" (Wilhelm et al., 2016a). Dynamics found in the literature that yield successful outcomes are now discussed and summarised in Table 19.

1. Sustainability maturity

Sustainability maturity can be described as the capability of a company to address environmental and social issues in the supply chain. Sustainability implementation requires a high degree of internal coordination and well-defined sustainability functions.

This can be measured by the internal complexity of a company: internal complexity is defined as the structure and processes established within the company (Gong et al., 2023). In the work of Gong et al. (2023), authors analyse a case study concerning IKEA's cotton-textile supply chain: IKEA is said to be "mature in addressing environmental complexity". IKEA has a dedicated cotton team responsible for the project of the sustainable cotton initiative, and this shows internal complexity, which is said to be effective in implementing sustainability initiatives in lower tiers. A similar result is obtained in Villena & Gioia (2018): authors claim that having a supportive organizational structure with a designated person responsible for the company's sustainability program enhances the possibility to extend sustainability agenda to suppliers. In this case, there is a top executive, responsible for accounting sustainability in the steering committee, and a sustainability chief officer. The objective is to guarantee that necessary resources are assigned for developing the sustainability initiatives. Overall, when a company possesses a supportive organizational structure that includes sustainability, it is well-positioned to promote the diffusion of initiatives throughout the supply chain, as sustainability is embedded in the structure and in the business strategy of the company.

2. Focal company and suppliers have supply chain visibility

If the focal company is aware of the risk of lower-tier suppliers, it is more likely that it will be able to diffuse sustainability standards (Villena & Gioia, 2018). Focal company may develop risk-mitigation programs for lower-tier suppliers, and also work with first tier to develop a risk mitigation plan, once they have visibility on the supply chain. Moreover, Wilhelm et al. (2016a) demonstrate that, in one of the industries analysed in their study, first-tier suppliers were able to diffuse the requirements thanks to high information transparency, meaning there is continuous interaction between suppliers and the focal firm. Grimm et al. (2014) identify also the willingness of direct suppliers to reveal its sub-suppliers to the focal company as a critical success factor for sub-suppliers' adoption of sustainable practices. From the work of Villena & Gioia (2018), there is evidence of one supplier which is referred to as the "informational nexus supplier" and has downstream visibility: in this case the supplier is motivated to being involved and participating in sustainability initiatives and it is easier for the focal company to diffuse sustainability standards. The success of this dynamic depends also on the nature of their downstream clients: if lower-tier suppliers serve sustainability leaders it is more likely

that they will adopt sustainability practices, but instead we have the opposite situation if the downstream customer is driven by cost performance. Indeed, in the work of Villena & Gioia (2018), there is evidence of lower-tier suppliers' sustainability improvement due to high pressure from the downstream customers.

3. Focal company has a small supply base

A smaller supply base allows the buyer to build closer and more collaborative relationships with its suppliers, hence facilitating the promotion of sustainability practices. Having a small supply base intuitively translates into managing lower complexity in the supply chain, as the buyer can monitor compliance more effectively and easily communicate sustainability initiatives and expectations. For the focal company, having a small supply base simplifies the sustainability management of lower tiers and allows to focus on fewer relationships with suppliers. From the work of Marttinen et al. (2023), it emerges that firms with a small supply base are more likely to implement collaboration practices, and there is evidence that having a small number of suppliers makes it possible to manage the suppliers in a more efficient way and thus the likelihood to spread sustainability in the network is higher.

4. Focal firm has a reward system for virtuous first-tier suppliers

A reward system can help the buyer in spreading sustainability initiatives in the supply chain effectively, as it is a tangible incentive for suppliers to comply with sustainability standards. In Villena & Gioia (2018), the focal company analysed has a system that makes it possible to identify and reward tier-one suppliers that collaborate and contribute to its sustainability effort. The companies analysed in the paper demonstrate that this reward system succeeds to foster sustainability agenda among their suppliers, who are in this way incentivized by the focal company as they are rewarded for their sustainability performance. Nonetheless, there is no evidence of a reward system for lower tier suppliers in their work.

5. Collaboration with relevant stakeholders (e.g. industry organisations)

Collaborating with third parties is beneficial for both the focal company and the suppliers. Villena & Gioia (2018) claim that focal companies collaborating with expert third parties are likely to cascade sustainability initiatives in their supply network. Third parties, e.g. NGOs and industry organizations, can also facilitate the knowledge and expertise

spillover. Focal companies that want to be active in the sustainability diffusion help suppliers become part of these industry organisations, so that they can share resources with industry partners and cascade sustainability requirements to lower tiers. Having the opportunity to be part of industry organisations helps suppliers being compliant with sustainability requirements as the supplier can use the same standardized self-assessment or audit with multiple customers. Moreover, for a focal company, being part of an industry organization can also make it possible to share the cost of trainings offered to suppliers with other focal firms participating in the same organization (Villena & Gioia, 2018). Thus, the participation in an industry organization helps achieving sustainability goals for the whole industry. Indeed, if more firms, or industry organizations, demanded the same standardised requirements, it is more likely that these are pushed forward. Moreover, also Wilhelm & Villena (2021) mention that the engagement with external stakeholders, such as industry organizations and multi-stakeholders' associations, facilitates the cascading of sustainability requirements, as it gives access to information, tools and trainings.

6. Supplier has an integrated management system

This specific code emerged from the work of Wilhelm & Villena (2021). An integrated management system can be defined as a structure that combines various management standards, such as those for quality, environmental management, and health and safety. Having an integrated management system is mentioned as one of the supplier attributes that positively affect the suppliers' adoption of sustainable procurement. In their study of the relationship of a big electronic company with its Chinese suppliers, authors claim that suppliers that possess an integrated management system that include among others also environmental and social pillars, are more likely to adopt sustainable procurement practices. For instance, ISO 14001 series require that suppliers "give consideration to the environmental performance and practice of its supplier" (Wilhelm & Villena, 2021). Indeed, the fact that the supplier has an integrated management system may facilitate the effective adoption of sustainable procurement and yield a successful outcome in terms of sustainability spreading along multi-tier supply chains.

7. Monitoring and supporting of suppliers

As Marttinen et al. (2023) state, collaboration practices based on support, sharing of information, trainings and workshops are key to spreading sustainability in the network. Supplier sees trainings as a possibility to gain expertise and knowledge to improve its

own sustainability agenda. The goal is for the supplier to develop its own sustainability program, so that it is also easier to identify difficulties that the supplier may face in implementing sustainability requirements (Villena & Gioia, 2018). Also, an important role is played by suppliers' visits, presence at supplier's site and continuous communication as stated in Marttinen et al. (2023). Visits allow the focal company to gather information about suppliers, and thus it helps in diffusing sustainability. The same can be stated about maintaining open communication with suppliers (Marttinen et al., 2023). This is confirmed also in the work of Schutte et al. (2022): authors highlight the importance of continuous communication in the successful implementation of sustainability-related practices.

8. Sustainability scorecards to evaluate and select suppliers

Sustainability scorecards are tools used by organization to monitor and evaluate the performance of their sustainability initiatives against defined standards. The main goal is to evaluate sustainability practices of the upstream network. If the focal firm's sustainability agenda is to be diffused to lower tiers, sustainability criteria must be included in suppliers' performance evaluation. Sustainability scorecard which incorporates labour and environmental criteria can be used when evaluating suppliers periodically. Suppliers are evaluated using scorecards based on sustainability KPIs. Also, it is helpful to adopt KPIs that include also lower-tier suppliers. This system helps the focal company keeping track of suppliers' conduct on sustainability requirements and taking consequent corrective actions if needed (Villena & Gioia, 2018). Nevertheless, sustainability scorecards are seldom found in first tier and almost never in lower tiers but can be of key importance for the focal company.

9. Regulatory pressures exerted on first-tier suppliers

Wilhelm et al. (2016a) define "regulatory pressures for sustainability" as external pressures stemming from "the government, consumers, and other stakeholders". When regulatory pressure is high there is a strict enforcement of local laws. The authors find out that usually a strong regulatory pressure can help first-tier suppliers to enforce their "secondary agency role", so to pass requirements to their own suppliers. In some of the case firms analysed, regulatory pressure represents a strong incentive for first-tier suppliers not only to be compliant with sustainability requirements but also to diffuse

them to their own suppliers. In their results, authors affirm that institutional factors, which include regulatory pressure together with lead firm's pressure for sustainability, have a positive impact on the double agency role of first-tier suppliers.

10. Supply chain leadership

The concept of leadership is not to be confused with the one of power, although they can be interrelated constructs as "leadership is built on power" (Jia et al., 2019). Leadership can be both transactional, which uses contingent reward, and transformational, which is based on inspiration and intellectual stimulation (Jia et al., 2019). Transactional leadership focuses on contingent reward; thus, the leader motivates other actors by offering rewards and incentives (Jia et al., 2019). On the contrary, transformational leadership verifies when the leader inspires other actors and encourages innovation. When dealing with transformational leadership, the focal company adopts an inspirational role: in this case, the focal company manages to inspire suppliers to include sustainability issues in their agenda and to transfer their sustainability goals to the suppliers (Jia et al., 2019). Also, the company provides expertise and financial aid to suppliers (Jia et al., 2019). Transactional leadership instead is mainly verifiable in a reward system and in the monitoring of suppliers to identify errors and accomplishments. In the three cases analysed by Jia et al. (2019), there is evidence that focal companies analysed applied transformational leadership on first tier and lower-tier suppliers and transactional leadership on middle-tier suppliers. Thanks to a well-developed and established leadership, there is evidence that also suppliers with no direct trading relationships with focal company are pushed to adopt sustainability initiatives, as they are inspired by the focal company's view on sustainability.

11. Geographical location of the supply base

The geographical location of the supply base influences the chances that the sustainability agenda of the focal company is diffused (Wilhelm et al., 2016a). When the distance is low, the diffusion of sustainability initiatives to suppliers is facilitated. The location is also a pivotal factor, as there are regions in which regulations are already strict (e.g. Europe) and in this cases it is easier to control suppliers (Wilhelm et al., 2016a). In the work of Grimm et al. (2014), geographical distance is identified as a critical success factor when managing suppliers: monitoring and managing lower-tier suppliers is facilitated when geographical proximity of members of the supply chain is reduced.

12. Trust between focal company and suppliers

Trust is founded on the expectation of behaviour that is mutually acceptable to all parties involved and it is essential for establishing long term relationships (Meqdadi et al., 2017). Grimm et al. (2014) claim that trust is a critical factor that enables the spreading of sustainability initiatives in the supply chain. In particular, if trust is present in the relationship, first-tier suppliers do not feel the risk that, by helping the focal company connecting with lower tier suppliers, they will be bypassed. Moreover, in the single case study analysed by Meqdadi et al. (2017), in which the development of a sustainability initiative in a supply network is explored, trust emerges as a key variable in spreading the initiative. There is indeed evidence of collaboration and interaction between focal company and suppliers in the implementation of the initiative. The supplier trusts the focal company, which starts the initiative, and decides to follow the focal company's plan to make the supply network more sustainable even without gaining economic benefits. In this dynamic of trust, the suppliers claim to participate in sustainability efforts due to the trust established between the parties, and some suppliers also make investments for the successful implementation of the initiative. In conclusion, the authors underline that trust between parties facilitates the success of the sustainability initiative, and encourage suppliers to make investments and adaptation to implement it.

13. Focal firm sets long term-goals for collaboration with suppliers

The focal company may set long-term goals mainly with first-tier suppliers (Villena & Gioia, 2018). This helps the likelihood of investments in sustainability from first-tier suppliers, who are involved for longer programs, and perceive taking part in the initiative as less risky. This dynamic does not seem to apply for sub-suppliers, due to other priorities and lack of resources. This result is confirmed also by Marttinen et al. (2023): in their work, both focal company and suppliers that set long-term commitment develop trust and are more likely to enhance sustainability in the supply chain. Indeed, for the case firms, long-term partnership with direct suppliers is a key and pivotal factor to cascade sustainability in lower tiers. Moreover, in Grimm et al. (2014), committed long-term relationships also between direct supplier and lower-tier suppliers are included as a critical success factor to spread sustainability in the network, as focal company in this case may be able to pass its requirements to lower tiers.

Table 19. Key factors facilitating the diffusion of sustainability in the supply chain

Code	Sources
Sustainability maturity	Gong et al. (2023) Villena & Gioia (2018)
Focal company and suppliers have supply chain visibility	Villena & Gioia (2018) Wilhelm et al. (2016a) Grimm et al. (2014)
Focal company has a small supply base	Marttinen et al. (2023)
Focal firm has a reward system for virtuous suppliers	Villena & Gioia (2018)
Collaboration with relevant stakeholders	Villena & Gioia (2018) Wilhelm & Villena (2021)
Supplier has an integrated management system	Wilhelm & Villena (2021)
Monitoring and supporting of suppliers	Marttinen et al. (2023) Villena & Gioia (2018) Schutte et al. (2022)
Sustainability scorecards to evaluate and select suppliers	Villena & Gioia (2018)
Regulatory pressures exerted on first-tier suppliers	Wilhelm et al. (2016a)
Supply chain leadership	Jia et al. (2019)
Geographical location of the supply base	Wilhelm et al. (2016a)
Trust between focal company and suppliers	Meqdadi et al. (2017)
Focal firm sets long term-goals for collaboration with suppliers	Marttinen et al. (2023) Villena & Gioia (2018) Grimm et al. (2014)

5.5.2 Passive firms

In the papers analysed, there are also situations in which firms result passive, meaning unable to pass sustainability initiatives to the lower tiers of their supply chain. The results of this classification are now described and summarised in Table 20.

1. Suppliers' location

Wilhelm & Villena (2021) in their analysis of a large electronic focal company and the dynamic with its Chinese suppliers state that first-tier suppliers are seldom keen on adopting sustainability practices and on spreading them. In this case, the reason is that they are often located in emerging countries where there is no mandatory sustainability legislation. Also, from the same study, another important information emerges: power of the focal company is immaterial with suppliers that present critical violations, thus it does not enhance the spreading of sustainability requirements nor their cascading. This is particularly true in developing countries, and in the ones where there is no particular pressure for sustainability (e.g. China, focus of the study). In this case pressures from the focal company are unsuccessful, as these countries are mostly driven by cost performance rather than sustainability compliance, and the first tend to compensate for the second one.

2. Legislation of market served

Another example of passivity in this context, intended as a situation in which sustainability regulations are not followed by suppliers, can be found in the work of Villena & Gioia (2018), where the focal company collaborates closely with both first and lower-tier suppliers if the final product is to be sold in the European market (and thus, it must met EU environmental standards) but this collaboration is completely absent if the product has to be sold to other markets.

3. Limited resources and limited sustainability expertise of suppliers

Cascading sustainability requirements require expertise and a strong relationship with key stakeholders: a lack of these capabilities may be the cause of a passive situation in which sustainability is not spread (Villena & Gioia, 2018). Even if the focal company is mature in dealing with sustainability issues, if direct suppliers do not have necessary resources, it is less likely that practices will reach lower tiers. Wilhelm et al. (2016b) highlighted a lack of resources in terms of sustainability in the lower tiers and that there is no designated

role assigned to directly manage sustainability issues. The lack of resources is said to be a major cause for the first tier not to be active with lower tiers, as there is no sustainability manager in the company analysed. In the same study, it is evident that resources can be also financial ones: there are no incentives provided by the lead firm, and being compliant implies costs. Often, the cost of spreading sustainability downstream is taken by the first-tier supplier. First-tier suppliers often lack the expertise to assess the sustainability of their suppliers, as they struggle with complying to sustainability requirements themselves.

4. Suppliers receive little attention from the media

Often suppliers are not identified by downstream customers, and thus they perceive a little reputational risk. There is a mention to this problem in the work of Villena & Gioia (2018): based on existing literature, they claim that lower-tier suppliers are more likely not to adopt sustainability standards as they are mostly unknown, thus receive little attention from the media and external stakeholders.

5. Suppliers perceive a very low risk of being penalized

Suppliers are said to be passive about environmental and social problems, also because they feel a very low risk of being penalized for not adapting to sustainability practices. Indeed, they are seldom penalized by their customers which are mostly first-tier suppliers. Passivity relies on the fact that often the request by focal companies to first-tier suppliers of spreading sustainability initiatives to lower tiers is seen as an additional expectation rather than a proper request. A lot of buyers require cascading sustainability requirements, but they do not stop purchasing from a supplier if this requirement is not met. Focal companies mostly check if first tier itself is compliant with the requirements but not if it spreads them lower in the supply chain. Moreover, there is passivity of lower tiers: lower-tier suppliers are said to "address their environmental and labour issues passively because they perceive minimal consequences for non-compliance" (Villena & Gioia, 2018) . Thus, if lower-tier suppliers do not perceive a tangible threat for non-compliance, this might result in a passive behaviour.

6. Focal firm has a large supply base

Passivity can be caused by high level of horizontal complexity. The higher this complexity, the more difficult it is to reach lower-tier suppliers. Moreover, this makes the

buyer dependent on first-tier suppliers to manage lower tiers. In Marttinen et al. (2023) authors find evidence that if the supply base is large, it is more difficult to ensure sustainability in the supply chain with interactive mechanisms.

7. Buyer's low bargaining power

When the buyer has low bargaining power, it is unlikely that supplier compliance toward sustainability will be reached. In the work of Dabhilkar et al. (2016), authors claim that it is likely that sustainable sourcing programs will not succeed when bottleneck items are involved, and this is due to the weak bargaining power of the buying firm. Bottleneck items show high supply risk, and thus the relationship is supplier dominated, this will result in a dependence of the buyer toward the supplier. In this context, the buying firm is in a dependent situation and there is no possibility to pressure the supplier towards sustainability. In Wilhelm et al. (2016a), it is highlighted how the lack of bargaining power also of the first-tier suppliers hinders their passing of sustainability requirements to lower tiers.

8. High network density

Network density is defined as the number of total connections in the network. More precisely, in Gold et al. (2020), authors define supplier-subcontractor density as "the average ratio of actual connections to potential connections in the supply network, denoted by the mean of the ratio of the number of edges to the number of possible edges". The more a network is characterised by high density, the higher will be the effort to manage it. Hidden ties in the network cause power asymmetries between the buyer and nexus suppliers and hinder standard diffusion from the buyer (Gold et al., 2020). In the same study, there is evidence that the more the supplier-subcontractor network is dense, the more the labour standards are unlikely to spread. High density of the network is negatively associated with sustainability standard adoption. Hence, a situation of passivity happens, for which requirements are not effectively spread in the network.

Table 20. Key factors hindering the diffusion of sustainability in the supply chain

Code	Sources
Suppliers' location	Wilhelm & Villena (2021)
Legislation of market served	Villena & Gioia (2018)
Limited resources and limited sustainability expertise of suppliers	Villena & Gioia (2018) Wilhelm et al. (2016b)
Suppliers receive little attention from the media	Villena & Gioia (2018)
Suppliers perceive a very low risk of being penalized	Villena & Gioia (2018)
Focal firm has a large supply base	Marttinen et al. (2023)
Buyer's low bargaining power	Dabhilkar et al. (2016) Wilhelm et al. (2016a)
High network density	Gold et al. (2020)

The classification indicates that both focal companies and suppliers can be effective in cascading sustainability initiatives in the supply chain. Specifically, while focal companies often take an active role in enforcing sustainability practices, there are also situations where suppliers exhibit characteristics that can make them active in the diffusion. Villena & Gioia (2018) give an important contribution to this topic: authors affirm that focal companies are active in diffusing sustainability, as they have the resources to do so, by involving suppliers, organizing trainings and collaborating with stakeholders. In their study, first-tier suppliers are labelled as reactive, as some respond to requirements, but never take the initiative proactively. Lastly, lower-tier suppliers are defined as passive in their commitment towards sustainability, and they are said to prioritize only the profit dimension. Conversely, Marttinen et al. (2023) hold a different position, emphasising that lower-tier suppliers are not passive with respect to sustainable supply chain management. According to the authors, lower suppliers are a source of sustainability innovation for the broader supply chain, as they are active in adopting sustainability practices.

In general, within the sample of papers selected, there was no specific study exploring the concept of “active” and “passive” firms in cascading sustainability practices. The only work that presents clearly these concepts is the one of Villena & Gioia (2018), in which there is the mention of active, reactive and passive firms. Also, Marttinen et al. (2023) briefly mention whether lower-tier suppliers are passive with respect to sustainable supply chain management. Lastly, Grimm et al. (2014) list some critical success factors to effectively manage suppliers. Although most factors focus on general perspective rather than sustainability, and their study does not specifically address the concept of active and passive firms, it provided useful insights to understand how firms can take an active role in diffusing sustainability initiatives in their supply chain. Despite these few studies, most of the information was gathered by searching for insights about factors contributing to firms being active or passive within the selected papers. Thus, further research is needed to explore the role of pivotal factors which drive firms to actively engage with lower-tier suppliers when spreading sustainability initiatives in complex multi-tier supply chains (Grimm et al., 2014) and to better understand the role of lower-tier suppliers in this dynamic (Villena & Gioia, 2018).

Chapter 6

6. Conclusions

This thesis adds to the increasing literature on Multi-tier Sustainable Supply Chain Management (MT-SSCM). In particular, this systematic literature review contributes to a deeper understanding of the role of power in diffusing sustainability initiatives in multi-tier supply chains. As the area of Sustainable Supply Chain Management (SSCM) has been largely explored, this work contributes to the research on MT-SSCM, a field which received less attention by researchers. Although the literature covering MT-SSCM has been steadily growing, few studies have examined power, power dynamics and power sources beyond the dyadic level – including also lower tiers of a supply chain – with a focus on social and environmental issues. Indeed, power in multi-tier supply chains remains an underexplored variable in sustainability diffusion, despite being a pivotal factor when studying how focal firms can effectively spread sustainability initiatives in the upstream tiers of their complex and fragmented multi-tier supply chains. Hence, this thesis filled this research gap by characterising the role of power and power dynamics in MT-SSCM, and their influence in diffusing sustainability throughout multi-tier supply chains.

This systematic review contributes to consolidate and synthetize the existing literature focusing on the interplay between sustainability and power in multi-tier supply chains. More specifically, the contribution to the field of MT-SSCM consists of the identification of five classifications which characterize the role of power within MT-SSCM. Some of these five categories – i.e. types of power, governance mechanisms, supply chain extent – have been previously examined in the extent literature, however this work provides the first systematic classification of the existing literature according to these categories. On the other hand, the distinction between active and passive firms as well as sources and dynamics of power have not been previously examined in the literature within MT-SSCM and the knowledge on these categories is reported and summarised by this literature review for the first time. Although the five categories have been – to some extent – individually analysed in previous studies, no study comprehensively explored their interrelation in the context of sustainability diffusion in multi-tier supply chains. Indeed, the attempt of this work is to integrate the identified classifications in a unified

framework, which will contribute to the understanding of the broader role of power in sustainability diffusion. Lastly, the thesis offers an overview on the current body of research on this topic. Hence, another contribution to MT-SSCM field is to identify shortcomings in the reviewed papers and to consequently suggest avenues for future research in order to address the current gaps in the literature.

The main findings suggest that power and power dynamics are of critical importance when the attempt is to effectively diffuse sustainability initiatives in multi-tier supply chains.

For what concerns the different types of power, the literature mainly classifies them in coercive and non-coercive power (Gruchmann, 2022; Marshall et al., 2019; Meqdadi et al., 2019; Touboulic et al., 2014). The outcome of the reviewed papers is that buyer power – and thus a situation of power asymmetry that favours the buyer over the supplier – may enhance a firm's ability to diffuse sustainability practices and this can have an impact also on the compliance of sub-suppliers (Hoejmose et al., 2013; Touboulic et al., 2014). Even though coercive power may have to be used to successfully enforce sustainability compliance, in the long term non-coercive power will be more effective in reaching also the lower tiers of the supply chain (Brockhaus et al., 2013; Gruchmann, 2022; O. Meqdadi et al., 2017; O. A. Meqdadi et al., 2019). In the literature analysed, non-coercive power is intended as expert, referent, reward and legitimate – as defined in the framework developed by Raven (1959) and adopted in this literature review. Despite general agreement in the papers analysed on the positive effect of the role of non-coercive power, no study – with the exception of Marshall et al. (2019) – provides examples of the individual components of this type of power, by studying their effects on sustainability spreading. The lack of a detailed analysis of these non-coercive types of power leaves a gap in the existing literature. Moreover, as Meqdadi et al. (2019) point out, future research in this area may address the investigation of the interaction between these different types of power in the process of sustainability diffusion, in order to understand if they reinforce one another or if instead they induce conflicts in the cascading of the initiatives.

Each paper was analysed from the perspective of the extent of the supply chain it covered. The majority of the papers covered a multi-tier perspective, analysing at least three tiers of the supply chain. This suggests that studies are increasingly adopting a multi-tier and network perspective, which is fundamental to explore sustainability diffusion beyond the

dyadic level – i.e. buyer-supplier relationship. Nonetheless, while it was always possible to understand the effect of vertical complexity on the spreading of sustainability initiatives, horizontal complexity was a concept presented in only a few papers. The role of horizontal complexity is deeply explored only in Touboulic et al. (2014), but it is not adequately addressed in all the other papers. As horizontal complexity – the relationship between suppliers – can hinder sustainability achievement in the long-term (Touboulic et al., 2014), future research should focus also on this dimension to search for further evidence and insights.

In this work, governance mechanisms have been explored following the framework by Tachizawa & Wong (2014): papers have been analysed based on the four approaches identified in the framework – direct, indirect, work with third parties, don't bother. The main result of this classification is that power and power asymmetry are contingency variables for managing sustainability in supply chains (Tachizawa & Wong, 2014; Wilhelm et al., 2016b). Moreover, power has a role in influencing the adoption of different governance mechanisms (Marttinen et al., 2023; Tachizawa & Wong, 2014; Wilhelm et al., 2016b): firms that follow a direct approach have more power, while less powerful firms opt for work with third parties or don't bother approaches. Thus, in the existing literature the correlation between power and the choice of different approaches in managing suppliers and sub-suppliers – depending on the resources available – is present. Nevertheless, power and governance mechanisms are not studied in conjunction in the literature, thus highlighting an important research gap.

A crucial finding of this work is the role of power sources in diffusing sustainability, as they create power dynamics in which either the buyer or the supplier is favoured. Imbalanced relationships between buyers and suppliers influence the management of supply chain sustainability practices (Schutte et al., 2022). Power sources that lead to buyer or supplier dominance are defined, and also a situation of power symmetry is explored. While power sources in Supply Chain Management (SCM) have been largely explored and studied, there is a notable gap in understanding how these sources of power can affect a firm's ability to cascade sustainability requirements in multi-tier supply chains. Among all the papers reviewed to conduct this literature review, only Marttinen & Kähkönen (2022) addressed this problem. Thus, this thesis provides an extension of their work by searching for evidence of power sources related to sustainability, and

clearly explores when focal companies can be in a position of power to spread sustainability initiatives.

The most novel contribution regards the exploration of factors that make a firm active or passive in diffusing sustainability in its supply chain. Although these factors were sometimes overlapping with power sources, the concepts of active and passive firms represent a significant advancement in MT-SSCM field. Only Villena & Gioia (2018) mention active, reactive and passive firms. Indeed, there can be substantial potential research on this theme. Furthermore, a result of this classification is that lower-tier suppliers have more chances of assuming a passive approach, thus in this case sustainability initiatives are not correctly adopted. When studying sustainability diffusion, often authors adopt a focal company perspective. Villena & Gioia (2018) and Meinlschmidt et al. (2018) stress instead the importance of managing lower-tier suppliers as they represent the greatest risk in a multi-tier supply chain. Indeed, there is the need for a deeper understanding of the role of lower-tier suppliers in pushing sustainability along the supply chain (Marttinen & Kähkönen, 2022).

This work has limitations to consider. The study is limited to the papers obtained by the keyword search and only considers articles published in English. Moreover, several studies analysed were based on case studies involving specific industries, and thus the generalizability of these results may be limited. Also, the most common dynamic was the one of a large focal company and the relationship with its smaller suppliers and sub-suppliers, thus it would be interesting to further investigate power dynamics in supply chains involving small and medium sized firms.

To deepen and broaden the understanding of the role of power in multi-tier supply chains, future studies could also investigate how the influence of power and power dynamics change when introducing new technologies – such as Blockchain and Internet of Things – in the supply chain. Indeed, the literature on the use of Blockchain solutions in Multi-tier Sustainable Supply Chain Management is growing, and many papers cover this topic. As relationships in multi-tier supply chains are complex and require constant information sharing, technologies such as Blockchain can ensure products' traceability. Although still in its early stages, Blockchain Technology (BCT) offers features that can enhance the effective implementation of MT-SSCM. It could be interesting to explore how adopting

these new technologies, which improve products' traceability, could influence power dynamics with suppliers.

In conclusion, exploring the role of power and power dynamics is imperative if the sustainability diffusion process in multi-tier supply chains is to be understood. To this extent, there is the need to engage in further studies investigating the complexity of today's multi-tier supply chains. This thesis contributes to MT-SSCM by providing a holistic view on how power characterizes the diffusion of sustainability initiatives. From the analysed literature, there are several research gaps which have been identified and hence there is the need for additional studies. Indeed, the role of power related to MT-SSCM is a topic that must be further explored if sustainable and ethic multi-tier supply chains are to be developed in our global economy.

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