

# The Greening of Global Value Chains

## Insights from the Furniture Industry

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*Document Version*  
Accepted author manuscript

*Published in:*  
Competition and Change

*Publication date:*  
2013

*License*  
Unspecified

*Citation for published version (APA):*  
De Marchi, V., Maria, E. D., & Ponte, S. (2013). The Greening of Global Value Chains: Insights from the Furniture Industry. *Competition and Change*, 17(4), 299-318.

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Download date: 04. Jul. 2025



# The Greening of Global Value Chains: Insights from the Furniture Industry

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Journal article (Post print version)

**CITE:** The Greening of Global Value Chains: Insights from the Furniture Industry. / De Marchi, Valentina; Maria, Eleonora Di; Ponte, Stefano. In: Competition and Change, Vol. 17, No. 4, 2013, p. 299-318.

DOI: <http://dx.doi.org/10.1179/1024529413Z.000000000040>

Uploaded to [Research@CBS](mailto:Research@CBS): May 2017

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## **The Greening of Global Value Chains: Insights from the furniture industry**

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### Abstract

The increasing fragmentation of production between independent firms that are spatially dispersed and are responsible for different steps of the production process poses particular challenges to firms that seek to green all the production activities linked with their product creation. We employ a Global Value Chain approach to examine how ‘lead firms’ shape the green features of upstream activities. Through comparative case studies in the Italian furniture industry (Ikea, Valcucine), we observe that lead firms implement ‘hands-on’ governing mechanisms to improve the environmental performance of their value chain partners – moving away from the market but still avoiding vertical integration – but also ‘hands-off’ mechanisms embedded in standards and design. We identify two governing approaches to the greening of value chains, standard-driven and mentoring-driven, provide some reflections on when we are likely to observe one or the other, and develop a future research agenda.

**Keywords:** environmental sustainability, global value chain, furniture industry, governance, Italy, Ikea, Valcucine

**JEL codes:** F23, L14, O31, Q01, Q55

### 1. Introduction

Firms are increasingly challenged to include environmental concerns in their business activities. Heightened environmental awareness of consumers, campaigns and direct action by NGOs and other civil society groups, and stringent national and supranational policies are forcing firms to be responsible for the environmental impact of all activities linked with their products, not just those that are carried in house. The fact that production is increasingly fragmented among independent firms that are spatially dispersed and are responsible for different steps of the production process poses particular challenges to firms that seek to produce ethically and reduce their environmental footprint. This is especially the case when it comes to monitoring and influencing the activities of second- and third-tier suppliers, in addition to those of first-tier suppliers, and when value chain partners are located in countries characterized by differential environmental standards. The many scandals that have involved branded corporations in the past two decades made them aware of the necessity to extend their corporate social responsibility practices and environmental strategies beyond their boundaries to avoid reputational risk linked to the poor environmental or social performance of first- or even second-tier suppliers (e.g., Nadvi, 2008).

Several studies, especially in the management literature, have highlighted how firms may foster environmental innovation within and outside their factories, but most contributions have confined themselves to analyzing individual firm’s strategies and green supply chain management practices and/or their relations with first-tier suppliers (Orsato, 2006; Seuring, 2008; Seuring and Müller, 2008). In this article, we examine how firms can successfully green their value chain going beyond first-tier suppliers, seeking to understand how traditional industries are transformed to take up the sustainability challenge rather than how new green industries are formed. We find the Global Value Chain (GVC) approach (Gereffi & Korzeniewicz, 1994; Gereffi, 2005; Gereffi, Humphrey, & Sturgeon, 2005;

Gibbon and Ponte, 2005; Bair, 2009) useful for this purpose for several reasons. First, its main interest is the analysis of the management and coordination of production activities in a geographically highly-fragmented setting. Second, its theoretical tools enable focusing on the role of lead firms in shaping the development of VCs and in governing flows of goods and knowledge. Third, despite its explicit focus on activities spanning international borders, GVC analysis has increasingly acknowledged the importance of local and national institutions and of embedded competitive advantages. And fourth, it explicitly focuses on opportunities for suppliers in terms of learning and market access as they participate in GVCs driven by lead firms. Through the empirical analysis of the furniture industry in Italy,<sup>1</sup> we examine how ‘lead firms’<sup>2</sup> in GVCs shape the desired green features of upstream activities, and illustrate different forms of coordination that they develop to achieve such goals. We identify two ideal-type approaches to governing the greening of value chains – a standard-based approach and a mentoring-based approach – and provide some reflections on when we are likely to observe one or the other.

## 2. Understanding the greening of industries through the Global Value Chain approach

The Global Value Chain (GVC) approach, which has been developing since the mid-1990s, focuses on the role of global players (or ‘lead firms’) in shaping governance structures and upgrading trajectories in VCs and is primarily used to understand the nature and the content of inter-firm linkages that span international borders (Gereffi and Korzeniewicz, 1994; Gereffi, 2005; Gereffi *et al.*, 2005; Gibbon *et al.*, 2008; Sturgeon, 2009). It is based on the recognition of a progressive disintegration of production and the general passage from a model of vertically integrated firms to complex forms of coordination between independent actors that are geographically dispersed but functionally integrated. GVCs are usually analyzed along five main dimensions: i) an input–output structure, which encompasses all the activities of the GVC; ii) a geographical configuration, which gives an account of where activities are located; iii) an institutional framework, encompassing the role of regulation, standards and broader rules that govern society and the economy; iv) an internal governance structure; and v) upgrading trajectories (Bair, 2009; Gereffi, 1999).

Other than a special focus on cross-border activities, a key characteristic of the GVC literature is an interest in how relationships among firms are developed in the effort to govern a chain. Governance in a VC is seen as the ‘authority and power relationships that determine how financial material and human resources are allocated and flow within a chain’ (Gereffi, 1994: 97). The GVC literature has underscored the role played by particularly powerful groups of companies, especially those that exert ‘buyer power’ by placing large orders in their supply chains. Instead of focusing on how they influence

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<sup>1</sup> Italy is the third country in the world in furniture production (after China and the US) and the second larger exporter (after China) (Csil, 2009).

<sup>2</sup> Much GVC analysis uses the term ‘lead firms’ differently from the management literature. GVC scholars are particularly interested in the process of how activities are organized along a value adding chain, leading to a specific functional division of labour. Therefore, they focus on a *group* of ‘lead firms’ (e.g., retailers or branded manufacturers), rather than on individual firms (e.g., Wal-Mart or Unilever). For GVC analysis, these ‘lead firms’ play a critical role by defining the terms of supply chain membership, by incorporating or excluding other actors, and by shaping how, where, when, and by whom value is added (Gereffi 1994; Gibbon & Ponte 2005; Kaplinsky 2005). The management literature uses this term to refer to firms that are particularly competitive in their market and able to influence its trajectory thanks to their strategic approach and distinctive capabilities (e.g. Lorenzoni & Baden-Fuller, 1995; Kim & Mauborgne, 2005). Our stance is that important lessons can be learned from individual firm experiences without losing track of the main objective of GVC analysis. Therefore, rather than aggregating the experiences of these firms, we distinguish different features that they employ in governing the greening of value chains.

governments or international organizations to obtain favourable rules, GVC analysts conceive these 'lead firms' as the core actors in cross-border business networks that are both internal to the (multinational) firm, and linked to independent suppliers and customers in increasingly elaborate and spatially extensive systems of sourcing, production, distribution, and consumption. The idea of 'governance' in GVCs rests on the assumption that, while both disintegration of production and its re-integration through inter-firm trade have recognizable dynamics, they do not occur spontaneously, automatically, or even systematically (Gibbon *et al.*, 2008). They are 'driven' by the strategies and decisions of specific actors, usually managers in large firms that hold key technological assets and control access to investment, key inputs, and final markets. The relevance of governance to GVC analysis is that it highlights the concrete practices, power dynamics, and organizational forms through which specific divisions of labour between lead firms and other economic actors arise and change over time.

The way the concept of governance has been applied in GVC studies has developed considerably since the mid-1990s. Early contributions (Gereffi & Korzeniewicz, 1994; Gereffi, 1994, 1999) to this literature focused on the role of lead firms – in the broad categories of 'buyers' and 'producers' – in the formation of production and distribution networks at the global level. Based mostly on the analysis of large multinationals in manufacturing industries, this literature showed how lead firms were able to drive the development of their industries by coordinating activities performed by independent supply chain partners located all over the world, rather than by vertically integrating. It also showed how lead firms have supported the development of the technological- and knowledge-base of their suppliers thanks to spill-over effects. This holistic interpretation of governance was later integrated by more specific analyses of how coordination takes place at individual nodes along a GVC through the identification of three intermediary governance structures between market and hierarchy: modular, relational and captive coordination (Gereffi *et al.* 2005). Other approaches to governance in GVCs have drawn on convention theory (Ponte, 2009; Ponte & Gibbon, 2005) and governmentality (Gibbon & Ponte, 2008) to examine its normative underpinnings.

In this article we adopt an approach to governance close to the first one discussed in the literature, aiming at describing how firms can drive the development of their chain toward the reduction of environmental impacts and the effects this has on industry organization and relations with suppliers (first-tier and beyond). The analysis of the greening of industries from a GVC perspective is still in its infancy, although a few contributions have attempted to provide a conceptual framework to include sustainability concerns within GVC analysis (Bolwig *et al.*, 2010; De Marchi *et al.*, 2013). At the same time, a rich empirical literature on the greening of industries is available. A number of studies have shown that buyers are 'going green' through hands-on governing mechanisms rather than through market relations or vertical integration, and that close interaction is likely to lead to a higher environmental pro-activeness of suppliers. In particular, empirical analyses of different manufacturing industries suggest that trust and long-term relationships are important factors in facilitating the greening of suppliers – along with stable demand and technical support. Meyer & Hohmann (2000), for example, proved the importance of partnership in developing successful green products through the analysis of a textile retailer that moved toward the use of organic cotton. It did so by forging relational coordination mechanisms in place of market relations. The analysis of five case studies of the textile industry performed by Seuring (2004) supports the idea that cooperation is needed to overcome

transaction costs, which are generally higher in the case of green products in comparison to non-green products and generate mutual dependence. Relational networks seem to become more important the more sustainability takes on a systemic dimension (e.g. with the adoption of an LCA approach) and the more complex the change is in the product or the production process to be introduced. Finally, De Marchi (2012) shows quantitatively how direct cooperation on innovation with suppliers and other VC partners has had an impact on the development of successful green products. Preliminary results on Italian manufacturing firms support the argument that cooperation becomes more important the more sustainability is at the heart of a firm's strategy (De Marchi & Grandinetti, 2013).

### **3. The greening of the furniture industry: background and methodology**

To further our understanding of the greening of industries, in this article we focus on the furniture industry, which is particularly informative because of its weight in the global economy and because of the pioneer role it played in acknowledging and managing environmental concerns related to production processes. Furniture is among the largest low-tech manufacturing industries globally, whose production in 2010 accounted for 376 million US\$ (Csil, 2010). The various stages of value chain operation were traditionally fragmented; starting in the late 1990s technological innovations have allowed a division of labour at the global level, which has resulted in a steep increase of the international furniture trade. The majority of furniture production takes place in industrialized countries but this share is fast shrinking to the advantage of transitional and developing economies – mainly China (it toppled Italy in 2005 to gain the number one spot as world leading exporter). Figure 1 depicts the functions performed along the furniture VC, subdivided in the broad areas of input provision, production, final product and distribution and sales. Furniture is a buyer-driven value chain (Kaplinsky *et al.*, 2008); retailers, branded marketers and branded manufacturers play a key role in governing and carry out the higher value-added activities in the chain: product design, marketing, customer support, retail and distribution.

#### **Figure 1 [about here]**

In industrialized economies, eco-friendly practices are now becoming mainstream (Handfield *et al.*, 1997; Klooster, 2005) also thanks to the diffusion of market-based certification schemes such as FSC, PEFC or SFI, which had a deep impact on the global structure of the furniture value chain and on its governance structures (Stringer, 2006). According to a recent survey administered to Italian furniture firms (Federlegno-Arredo, 2010), input provision and production are the functions more often at the centre of improved environmental practices. In relation to inputs, the main environmental challenges concern resource consumption and the reduction of biodiversity generated by inconsiderate use of forests. This is usually addressed through the use of certified wood and recycled raw materials. In relation to production processes, the main environmental concerns are emissions and hazardous substances, which are usually handled through the use of lower-polluting varnishing systems, such as water-borne varnishing, and by reducing the use of chemicals and energy.

The methodology used for our analysis is an inductive multiple-case study, which is appropriate to answer research questions of the 'how' and 'why' type (George & Bennett, 2005; Yin, 2003). The analysis is based on the study of two companies, Valcucine and IKEA, and their value chain partners. These two firms were selected because both are successful in their respective markets and are

committed to sustainability:<sup>3</sup> for IKEA, sustainability is a tool to reduce costs; for Valcucine, it is part of a differentiation strategy. Both firms have internationalized their operations both upstream and downstream, although for IKEA the global dimension is more evident since it exports and imports almost 95 per cent of its products. The case studies have been deliberately selected to offer contrasting situations in terms of environmental approach, size, business model and internationalization strategies to improve the internal validity of the analysis (George & Bennett, 2005; Yin, 2003). IKEA and Valcucine represent two archetypes: IKEA is the typical multinational firm selling low-cost items that have been produced by a large number of suppliers all over the world; Valcucine is the typical district firm producing high-end furniture, relying on a wide network of (mainly local) partners.

In addition to the two focal firms, we analyzed some of their most important first- and second-tier suppliers (see Table 1). The most important data source was interviews with firms' informants, including entrepreneurs, environmental managers, R&D executives and purchasing manager (18 in total, 6 with the lead firms and 12 with their suppliers; some suppliers work with both firms). All interviewed suppliers are based (or have subsidiaries) in Northern Italy. Italy has a long tradition in the furniture industry and is the top country in Europe in terms of employment and value added generated in this industry. It is also the third country worldwide for furniture production, the second larger exporter after China (Source: CSIL, 2010), and the 3rd supplier country for IKEA. These factors, and the growing relevance of environmental-related practices in the furniture industry - especially for firms located in advanced economies compared to low income producers - makes Italy an important entry point for understanding the greening of the furniture GVC, in a dynamic scenario where geographical differences across markets are still relevant (Kaplinsky *et al.*, 2011). Evidence emerging from firm-level interviews was triangulated with information gathered through interviews with leading experts (a total of 14, including industry associations, local agencies, industry service agencies and trade union associations) and with direct observation through field visits and corporate and non-corporate documentary information.

**Table 1 [about here]**

## **4. IKEA and Valcucine: A Comparative Case Study**

### ***4.1 Value Chain Structure***

The Swedish-based global company IKEA is by far the largest furniture retailer worldwide. Its turnover almost never stopped increasing since its foundation in 1943. In 2012, it was 28. per cent larger than 5 years before, amounting to €27.6 billion. In the same year, the company had 139,000 employees, located mainly (71.2 per cent) in Europe and working in the retail function (corporate data). Social and environmental sustainability are currently tightly woven into the firm's overall strategy. In the early 1980s IKEA took up the environmental challenge as a response to policy and media pressure. Later, it

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<sup>3</sup> Several national and international awards received by Valcucine for the eco-design of its products testify its commitment to the reduction of environmental impacts of their product; the number of sustainability initiatives and actions undertaken by IKEA and reported, with detailed figures, in the company annual sustainability report, support the commitment of the Swedish multinational to social and environmental improvements along its value chain. Despite IKEA is involved in several industry, the present analysis will focus just on the wood-home furnishings, which represents both the core of IKEA's operations and the business area in which it has developed more advanced practices to the increase environmental performance of its supply.



became more proactive and developed a coherent environmental strategy since it recognized that there was a huge potential in terms of costs saving (Reichert & Larson, 1998; Stenebo, 2010). Starting in 1998, it developed its environmental and social guidelines into a coherent set of requirements to be applied throughout the entire VC, which resulted in the introduction of the IWAY code of conduct in the 2000s (see also Andersen & Skjoett-Larsen, 2009; Konzelmann et al. 2005).

Valcucine was founded in 1980 in Pordenone in North-east Italy, and is specialized in the production and commercialization of kitchens for the high-end market. In 2011, the company employed 176 people, 18.9 per cent higher than 5 years before, and had a turnover of more than €38 million, almost half from sales in foreign markets. The success of Valcucine relies on its business model, a mix of high product quality, attractive aesthetic design, technological innovation and attention towards sustainability. The firm has prioritized the reduction of the environmental impact of production and consumption since the beginning (Bettiol *et al.*, 2011). As it grew, this feature became one of its core competitive advantages, strongly built in its corporate culture and brand.

Both firms outsource the majority of production activities, and are focusing mainly on higher value-added functions such as design and marketing (see Table 2). They represent examples of the ‘manufacturers without factories’ examined in the literature on buyer-driven value chains (Gereffi, 1999). However, the two firms organized their VC differently. IKEA has some productive facilities managing almost all the manufacturing steps of the wood furniture VC but representing a minor part of the firm’s input, and relies on a wide and global network of suppliers (1,084 suppliers located in 53 countries), which provide the majority of the 9,500 products of its range (see also Stenebo, 2010). Valcucine does not perform any manufacturing activity except for assembly, and relies on a network of almost 300 suppliers to manufacture kitchen components, located mainly in the proximity of Valcucine.

**Table 2 [about here]**

While design and marketing have gained much importance, the retailing function is still the most important activity for the Swedish multinational: IKEA-branded products are sold exclusively through IKEA stores. IKEA products are designed and developed mainly by the group company IKEA of Sweden. Collaboration with suppliers is needed for the introduction of more complex innovations (see Baraldi, 2008), but more often it is IKEA that shares knowledge and information with suppliers to ensure the upgrading of their technological and environmental capabilities (Ivarsson and Alvstam, 2010a; 2010b). For Valcucine, design and marketing are the major activities that are performed in-house. Sales are carried out by specialized retailers all over the world and through a few flagship stores. Valcucine is responsible for the marketing and the aesthetic design of almost all their new products, but cooperates with suppliers on more technical features.

#### ***4.2 Environmental practices at IKEA and Valcucine***

Both firms are committed to reduce their impact on the environment but differ in the priority they place on different environmental problems and on the approach they take to tackle them (see Figure 2 and Table 3). IKEA’s priorities are reducing GHG emissions and managing a sustainable use of natural

resources, while Valcucine's ones are reducing the amount of materials used in the production process, reducing the environmental impacts of furniture disposal and improving recyclability.

**Figure 2 [about here]**

**Table 3 [about here]**

In addition to reducing the environmental impacts at the input level, Valcucine focuses mainly on innovation in the final product. IKEA focuses on production, distribution and sales. As far as inputs are concerned, IKEA requires part of its wood furniture to be made by wood coming from forests that are certified as responsibly managed (22.6% of wood used is FSC certified), substituting solid wood to the advantage of board material, and using renewable, reclaimed and recyclable materials. According to corporate documentation, in 2012 91% of the material used in IKEA's products were renewable, recyclable or recycled. Valcucine uses materials such as aluminium and glass, which are recyclable and require a lower amount of glues and other chemicals. As far as wood is concerned, it uses species grown in purposely-created plantations or in European forests in which certified forestry projects are in course. More importantly, the design developed by the company enabled a drastic reduction of raw materials used; for example, the development of a special door consisting of an aluminium frame over which the glass, steel or wood panel is added, allowed reducing the thickness of the door from 20 to 2 mm.

The strongest focus for IKEA is on processes – reducing the impacts of production and distribution on GHG emissions, soil and health – rather than on the product itself. Coherently with the policy of the firm to produce at the lowest cost, IKEA continuously introduces incremental innovations aiming at reducing materials and energy use and at minimizing waste throughout a product's life-cycle. Thanks to the flat-packaging design and the 'assemble-it-yourself' model (born as an additional way of keeping costs at the lowest level), the company is able to lower emissions throughout distribution. Furthermore, it is continuously improving energy efficiency and the use of renewable energy at its stores; in 2012, 34% of the total energy consumption was produced by renewable sources. Moreover, it has patented special pallets made by recycled and recyclable plastics that optimize storage and transportation, it requires that low emission trucks ship its products, and it has invested in reducing emissions, improving waste efficiency and increasing renewable energy use in its stores. It is increasingly committing to improve the environmental performance of its products, but mainly as far as energy consuming appliances rather than furniture products are concerned.

Valcucine has also introduced process innovations to improve eco-efficiency, reducing toxic emissions and waste. In 2001, it was the first Italian kitchen manufacturer to obtain ISO14001 environmental certification. To reduce the level of formaldehyde and other toxic emissions linked to its products, it developed together with suppliers a water-borne varnish to be applied on its wood products. All packaging used by Valcucine and at their main suppliers is made without using polystyrene and employs recycled cardboards and paper tape. However, Valcucine is not involved in the reduction of environmental impacts at the level of distribution and retail, given that it has no direct control of these functions. At the same time, it has much stronger commitment than IKEA on reducing the environmental impact of the product itself. Through careful design, Valcucine's kitchens embed several

features that make them environmentally cutting-edge. Kitchens are designed to be technically and aesthetically durable. Most of Valcucine products are also highly recyclable (one kitchen model is 100 per cent recyclable), thanks to raw material selection (e.g., glass and aluminium) and the use of one-material components that are put together purely by mechanical joints. Finally, every accessory of the kitchen (such as lights and electronic appliances) is chosen among the most environmental-friendly available on the market.

### ***4.3. Governing the greening of global value chains***

In the previous discussion, we examined the greening business strategies employed by IKEA and Valcucine. In the following sections, we explain what governing tools these firms have employed to make sure that their first- and second-tier suppliers contribute to such a result. We highlight three groups of governing instruments: standards and certifications, product design and knowledge transfer.

#### **Standards and certifications**

A governing instrument that firms can use to facilitate environmental improvements by their suppliers along a VC is to require compliance with third-party environmental certifications and/or with their own specific environmental and quality standards. Both IKEA and Valcucine require their suppliers to use FSC-certified wood for part of their products – a certification that guarantees that wood is sourced from responsibly managed forests. They also control the compliance of incoming products with environmental and quality standards they set. But in relation to their suppliers' production processes, the two firms have adopted very different approaches. IKEA demands ISO 14001 certification from their suppliers and the compliance with its own Code of Conduct (IWAY). This is a central feature of IKEA's greening approach and allows the company to verify the environmental performance of all suppliers through a routinized process and regular audits. Existing and potential new suppliers have to comply with the start-up requirements listed in the IWAY. On the contrary, holding an environmental process certification is usually not a prerequisite to be in business with Valcucine, since their small family-run suppliers would not afford the high costs of compliance and certification. Also, Valcucine places more value on innovative applications for reducing the impact on the environment that go beyond the more 'standardized' improvements embedded in existing certification systems. In other words, the environmental features of the product are guaranteed by a tough internal control system, while the control of suppliers' manufacturing process is less formalized and more based on first-hand knowledge of the processes used by suppliers. This is achieved through frequent on-site visits and by co-developing process innovations. This is the case, for example, of the air emission and health improvements achieved through the co-development of a new water-borne varnish by Valcucine and their supplier Biesse Crea.

Standards and certifications, such as FSC and IWAY, require suppliers to be responsible also for the environmental performance of second-tier suppliers, therefore expanding the scope of these tools beyond the relationship between lead firms and first-tier suppliers. FSC, for example, requires the traceability of wood from the forest to the final product and that each actor in this chain is FSC certified, in order for the final product to be certified.

*'At IKEA they are great in codifying, they tell you everything you have to do: they explain it all to you. They have a team of people devoted just to handle environmental topics!'* (Environmental manager, Media Profili)

*'They [Valcucine] haven't asked us any environmental certifications, but they came to visit our production facilities [...] and they know our technology very well'. (R&D manager, Eureka)*

## **Product design**

Our study shows that both firms use design as a powerful governing instrument to influence environmental performance along their VC. Through design, they have achieved the reduction of the environmental impact of suppliers' activities, even without the need for their direct contribution. This is especially true when lead firms require suppliers to use input and raw materials that ensure lower environmental impacts (for example, FSC certified wood). But it is also the case for innovations that reduce the consumption of energy and materials. An example is an innovation introduced by Valcucine to reduce the environmental impacts of its supplier of door handles (Eureka). Valcucine designed kitchen door handles that are dry-manufactured, thus ensured that suppliers drastically reduce consumption of energy and chemicals. Similarly, the design of the two-components doors (made by the aluminium frame plus the door) allowed reducing material and energy use along the entire VC (e.g., the reduction up to 80 per cent of materials used to produce Valcucine's doors and worktops), and boosted environmental innovations in inputs (e.g., the substitution of PVC with less toxic materials). Similarly, the design of the table 'Lack' by IKEA, co-developed with suppliers (see Baraldi & Waluszewski, 2007), that allowed them to save up to 30 per cent in energy and materials, because of the so-called 'board-on-frame' manufacturing technology, consisting of a 'honeycomb' paper structure (see also Edvardsson *et al.*, 2006; Baraldi & Waluszewski, 2007). These are instances showing how greening features 'travel' along the Value Chain, embedded in product design specifications. Transmission mechanisms enable not only first but also second-tier suppliers to reduce their impact on the environment in terms of reduction of raw material use, GHG emissions and the like.

*'We give very detailed specifications about environmental characteristics of the products, and suppliers have to respect them in detail'. (Environmental manager, IKEA Italy)*

*'They [Valcucine] do not oblige us to do anything. They know very well the production process [of the aluminium] and they give us precise specifications'. (R&D manager, Eureka)'*

## **Knowledge-transfer and support**

Since there is a scarcity of suppliers that already employ low-polluting technologies and that can also match the required quality, costs, flexibility and organizational requirements, IKEA and Valcucine often engage with suppliers that initially do not achieve the desired environmental performance and invest to support their greening, rather than substituting them with already 'green' ones. Even though suppliers may have high technological and production competences (e.g., in the production of doors, wood treatment, etc.), they often lack environmental knowledge. Buyers, on the other hand, have deep knowledge on where along the chain the most problematic environmental impacts are, and on how to address them. Both IKEA and Valcucine were able to achieve a reduction of the environmental impacts

of the value chain by heavily supporting suppliers (providing them with knowledge on the product, processes or organization) and, less often, by providing financial support (in terms of joint investments and favourable payment conditions). This process can be seen as the starting point to foster the environmental upgrading of suppliers (De Marchi *et al.*, 2013).

IKEA has established formal projects (Supplier Energy Efficiency Projects – SEEPs) to transfer know-how in eco-efficiency improvement to some of its key suppliers and offers them procurement support, as described in the following paragraph (see also Ivarsson & Alvstam, 2010a; 2010b). Similarly, Valcucine shares knowledge about technical and environmental aspects. It suggests what are the most impacting activities at the supplier level and how to reduce them, and collaborates with suppliers in developing new solutions. More importantly, both IKEA and Valcucine worked to sensitize their suppliers about sustainability, explaining why it was important to reduce environmental impacts and why this process could yield important economic benefits for suppliers.

*‘They [IKEA] proposed the project [SEEP] to us and we decided to work with them on it. Of course for them this is a way to make us work better and for them is important to have environmental-friendly suppliers since they are an ethical company. However, for us it works well too, because they give us very good consultancy services and for free. They sent us a great consultant whom I would have not known where to find otherwise!’ (Environmental manager, Media Profili)*

*‘We have been trained and we understood that other than reducing the impact on the environment, which is very important, there was an economic advantage for us too’. (Environmental manager, Media Profili)*

*‘[We convinced them to introduce environmental innovations because] we make our name weigh upon them, but also because it can be useful for them too [...] they can see the utility that this can have for them’. (R&D manager, Valcucine)*

#### **4.4 Governing the greening process beyond first-tier suppliers**

Both IKEA and Valcucine took on the responsibility of influencing production processes along their entire VCs. Acknowledging the complexity and strategic importance of controlling and ensuring compliance further upstream in the VC, both firms are extending their direct influence by creating incentives for first-tier suppliers to influence their own suppliers and by directly engaging in the monitoring and influencing of second-tier suppliers.

First-tier suppliers are in charge of guaranteeing the respect of minimum environmental standards by their own suppliers, as codified in product specifications. IKEA specifies that it is the suppliers’ responsibility to ‘ensure that their sub-suppliers acknowledge, understand and accept the IWAY requirements’ (IKEA Group, 2009). This is responsibility to inform, rather than direct control of production activities further upstream in the VC. Suppliers usually deal with this duty rather easily by requiring their own suppliers to provide certifications of conformity and by testing incoming products. Product design, conceived by the lead firm and encapsulated in the product specifications, also indirectly drives the greening of the VC. It orients other actors towards greener raw materials and ensures that the producers of all components reduce their impacts even without directly requiring it as

part of a sustainability strategy. This way, lead firms create incentives for suppliers to ensure that their own suppliers' products are environmental-friendly.

*'Everybody in the chain, also our suppliers, benefits from working according to the [environmental and quality] standards required. If you cheat, they'll catch you. The large-scale retailers like IKEA have an organization that is devoted just to control, so you won't get off scot-free'. (Environmental manager, Media Profili)*

*'Now is easier for us, because all the chain has moved [toward a more environmental-friendly production]'. (Entrepreneur, ILCAM)*

Lead firms rely on first-tier supplier controls usually for non-strategic activities, leveraging on the design and standards and certification tools to indirectly (yet effectively) influence second-tier suppliers. But when it comes to strategic activities, they adopt more sophisticated and direct actions. IKEA monitors second-tier suppliers' performance by enforcing standards and certifications and by directly influencing the sourcing activities of its first-tier suppliers. To ensure that green raw materials are used to produce its products, IKEA: i) became the supplier of some of its first-tier suppliers; and ii) spurred the development of a market for green inputs through direct and indirect actions. In some instances, IKEA directly integrated sourcing into its activities, selling raw materials to their first-tier suppliers. In the case of wood, IKEA even vertically integrated the function of raw material production and treatment by establishing Swedwood – a subsidiary that secured the supply of FSC certified wood (which at that time was still very scarce) to IKEA's first-tier suppliers. Moreover, the group directly spurred the improvement of the environmental performance of second-tier suppliers by incentivizing first-tier suppliers to buy from second-tier suppliers that achieved IWAY certifications and that were audited by IKEA itself. If first-tier suppliers opt not to buy from any of the certified second-tier suppliers, they are required to provide additional paperwork to ensure that these suppliers exceed the minimum threshold of environmental performance required by IKEA. Furthermore, the group engaged with NGOs such as WWF and Rainforest Alliance to increase the availability of certified wood, and developed a specific unit, the 'wood supply function', 'to support selected wood-suppliers in developing efficient and sustainable supply strategies' (IKEA Group, 2009). Through these mechanisms, IKEA directly supported the greening of second-tier suppliers and the entire VC. It enabled suppliers to access a large and stable demand and created the incentives for firms along the VC to invest in reducing the impacts of their production process, even though IKEA does not have a direct market relation with them.<sup>4</sup>

In contrast, Valcucine cooperates on innovation with its suppliers, sharing its knowledge and cooperating to find low impacting solutions. Moreover, it actively looks for second-tier suppliers that can match their requirements and works in harness with them and with first-tier suppliers to develop new products. The water-borne varnishing innovation, for example, was developed in close cooperation not only with its first-tier supplier (Biesse Crea) but also with a varnish producer (Oece) and a machinery company (Technospray), which Valcucine itself contacted for the purpose. Thus, to develop

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<sup>4</sup> This evidence emerged from visits to trade fairs and conferences, where component-producers displayed the IWAY certification among the certifications they achieve, such as ISO14001 or ISO9001. When asked about the reason why they complied with IWAY standards, some of them reported that they actually were not yet IKEA's second-tier suppliers but they went through IWAY certification process with the hope of entering the 'IKEA market'.

a new technology for the worktops and the doors of the kitchen, Valcucine fostered the cooperation of a supplier specialized in glass production with another one that mastered a technology for surface treatment.

Given the high number of second-tier suppliers they source from, both firms are focusing their direct effort toward those whose production processes are potentially most harmful to the environment or those that are more important in terms of value addition to the final product. IKEA's influence on second-tier markets is broader and deeper than Valcucine's, involving a higher number of suppliers and covering all the main environmental issues. Despite being much smaller than IKEA, Valcucine has been able to propagate greening processes along the VC. Its impact has been more profound than that of IKEA on the limited number of suppliers it heavily cooperates with. Few of IKEA's first-tier suppliers interviewed changed their own suppliers with those suggested by IKEA, except for non-strategic components (e.g., pallets made of recycled plastic). A non-strategic second-tier supplier for IKEA (Eureka) declared that IKEA's strategy had no effect on their practices. However, the majority of IKEA's suppliers asserted that its actions were very powerful in improving their attention toward environmental issues.

## 5. Discussion

Our main purpose in this article is to explain what kinds of governance mechanisms are employed by lead firms to drive greening processes along the furniture value chain. We are not concerned with explaining different forms of coordination at various chain nodes, but rather with highlighting how different mechanisms could lead to a similar set of outcomes. Therefore, we did not use the independent variables of Gereffi et al.'s (2005) model (the complexity of information exchanged between value chain tasks; the codifiability of that information; and the capabilities resident in the supply base relative to the requirements of the transaction), as these are normally employed to explain a variety of forms of coordination at specific value chain nodes. Our analysis is exploratory; rather than providing a predictive theory of greening in value chains, we aim at explaining how lead firms engage first- and second-tier suppliers in the greening of value chains, using the tools described above to various degrees.

The comparative case analysis carried out in this article suggests that both IKEA and Valcucine governed the greening process by engaging in deep relationships with their suppliers, rather than by implementing purely market-based relations or by vertically integrating: they contributed to suppliers' innovative activities, they ensured suppliers' environmental performance through monitoring, and they supported the rolling out of greening strategies. These approaches introduce high switching costs for lead firms, which are not minimized even when harmonized standards exist (see Nadvi, 2008). To minimize greening costs, these two firms engaged in long-term, complex relationships with suppliers and concentrated their efforts mainly toward strategic suppliers. They required the achievement of minimum levels of environmental performance from all suppliers, but demanded the development of more complex innovations from, and implement more advanced environmental supporting projects with, strategic suppliers only.

*'We work in long-term partnerships on a par with suppliers, which are based on shared standards and on collaboration. We do not go to the market to find the lower price with on-*

*line auctions like many other companies do. We go to a supplier and tell them: 'we have to produce this thing with these characteristics, you should be oriented this way' and we try to work together to gain the highest efficiency, have a good product and maybe we even develop it together in detail so to achieve an even higher level of efficiency'. (Environmental manager, IKEA Italy)*

*'We know each other very well for a long time. [...] They are our partners, we could say that some of them are friends!'* (Purchasing Manager, Valcucine)

Of course market power was important for both firms, but especially for IKEA, in pushing suppliers to achieve the desired environmental benefits. However, considering the implications of switching costs as described above, this power did not take the shape of a coercive regime, like in many other industries (Newsome et al, 2013). Rather, it was manifested in terms of the ability to create incentives (high volumes, secure demand, learning, reputation) that could overcome the additional costs incurred by suppliers.

*'[We convinced them to introduce environmental innovations because] we make our name weights upon them but also, what we ask can be useful for them too [...] they can see the utility that this would have for them'. (R&D manager, Valcucine)*

*'We have been trained and we understood that other than reducing the impact on the environment, that is very important, there was an economic advantage for us too'. (Environmental manager, Media Profili)*

Beyond these commonalities, however, two fairly distinctive approaches to governing the greening of VCs emerged: (1) a standard-driven approach, emerging from IKEA's experience and possibly indicating an archetype explaining the greening of value chains in other large MNCs; and (2) a mentoring-driven approach, emerging from Valcucine's experience and possibly an archetype for greening experiences in other SMEs.

### **5.1 Standard-driven greening**

The experience of IKEA suggests a typology of standard-driven greening of VCs, where lead firms themselves identify the main environmental impacts to be reduced. They decide how to deal with them and embed such information into standards that first- and second-tier suppliers have to comply with. These standards, applying to both products and processes, may or may not include already existing standards. They affect both the supplier selection process and the relation between lead firms and existing suppliers. Standards are enforced through a strong monitoring effort, knowledge transfer and other supporting tools. The lead firm takes on the responsibility of controlling that all first-tier suppliers and key second-tier suppliers comply with them.

Standard-driven greening suits best the environmental improvements that are linked to eco-efficiency or other impacts linked with the production process. It enables both lead firms and suppliers to gain from the reduction in manufacturing costs, rather than asking consumers a premium price for the additional environmental features. This approach is better fit for larger firms that aim to achieve cost-leadership in their price-sensitive market and that need to deal with a large number of suppliers located in countries characterized by different levels of environmental compliance. In these countries,



standards and certifications help communicating to each supplier the necessary information to produce a predetermined and run-of-the-mill product – allowing lead firms to safeguard the homogeneity of products and production processes.

## **5.2 Mentoring-driven greening**

Mentoring-driven greening of VCs is based on personal interactions with first- and second-tier suppliers. Transactions with suppliers are complex and handled through trust, reputation and face-to-face interactions. All actors are mutually dependent on knowledge and skills: the lead firm exerts leadership on environmental knowledge, while suppliers have a lead on technical knowledge. Environmental problems and their solutions are considered on a case-to-case basis and do not necessarily need to fit easy-to-measure metrics. The main tools used by the lead firm to green the VC are design and product specifications, which enable suppliers to improve their environmental performance even if they have a low environmental awareness to begin with. Similarly to standards in the first approach to greening, design represents a ‘hand-off’ mechanism with indirect yet effective impacts along the entire VC. But this is complemented by recurrent visits to the facilities of both lead firms and suppliers to facilitate the flow of knowledge and information and to enhance the suppliers’ environmental capabilities. Moreover, as observed in other VC studies (Humphrey & Schmitz, 2008) mentoring activities are important to spread knowledge in the form of technical assistance. Yet, such role of mentor can also be played by lead firms, in addition to independent parties such as NGOs or international agencies (see also Ivarsson and Alvstam, 2010b). The relational dimension of this form of greening does not imply low levels of monitoring: control of the environmental features of products is formal and exerted through thorough tests, whereas the environmental performance of supplier processes, which is more difficult to verify, is handled through personal interactions and trust-based mechanisms.

This kind of approach is best suited to innovations aimed at reducing the impact of the final product rather than of manufacturing processes on the environment. The flexibility enabled by informal monitoring facilitates the introduction of more radical innovations. It suits best smaller firms that compete on the basis of quality, innovation and design, that source locally, and for which sustainability is a way of differentiating from competitors in niche markets.

## **6. Conclusion**

In this article, we applied global value chain (GVC) analysis to examine greening processes that go beyond the boundaries of individual firms and the dyadic relationships they have with first-tier suppliers – to also explain the transmission mechanisms and governing instruments that reach second-tier suppliers and beyond. By analyzing the various stages of the furniture value chain – input, production, final product assembly, distribution and sales – we highlighted a variety of green strategies and how these are transmitted from lead firms to other actors along the furniture value chain. We offered an original contribution to current discussions on the greening of traditional manufacturing industries by highlighting two different governing approaches to the greening of the furniture value chain – a standard-driven approach and a mentoring-driven approach. The first seems to be best suited to drive environmental improvements that are linked to production processes and eco-efficiency. The

second is more likely to be employed to drive systemic reductions in the environmental impact of the final product.

Consistently with much of the GVC literature, our analysis supports that lead firms play a crucial role in governing the greening of value chains. However, it also highlights that they engage in deep relationships with their suppliers in the greening process, alongside with more ‘hands-off’ governance mechanisms embedded in standards and design. No matter what their strategic orientation is, when greening becomes a key competitive advantage lead firms tend to govern the value chain in ways that seek to engage their suppliers. The lack of general environmental standards for final products in the furniture industry leaves room for both firm-based solutions and the development of own standards. Finally, our research shows that both small and large firms can govern the greening of value chains through their relative competences. No matter the size, lead firms implement hands-on governing mechanisms in order to improve the environmental performance of their value chain firms, moving away from the market but still avoiding to vertically integrate.

In this article, we have provided an incremental step in the direction of understanding the governing of greening in global value chains. Further research should investigate how the greening practices emerging from our analysis relate to the governance structures identified in the GVC literature (Gereffi et al. 2005; Sturgeon, 2009). A future challenge lays in understanding how greening approaches and the overall governance of value chains shape each other. Moreover, further research is needed to assess to what extent the evidence emerged in this empirical context can also apply to lead firms located in countries where environmental awareness and standards may be lower, such as in emerging economies. The empirical setting of this study was a typical buyer-driven value chain, thus also needs to be expanded to producer-driven industries. Finally, the environmental considerations we have developed should be further explored within the broader picture of corporate social responsibility, in order to evaluate other economic, social and labour implications of the greening of industries.

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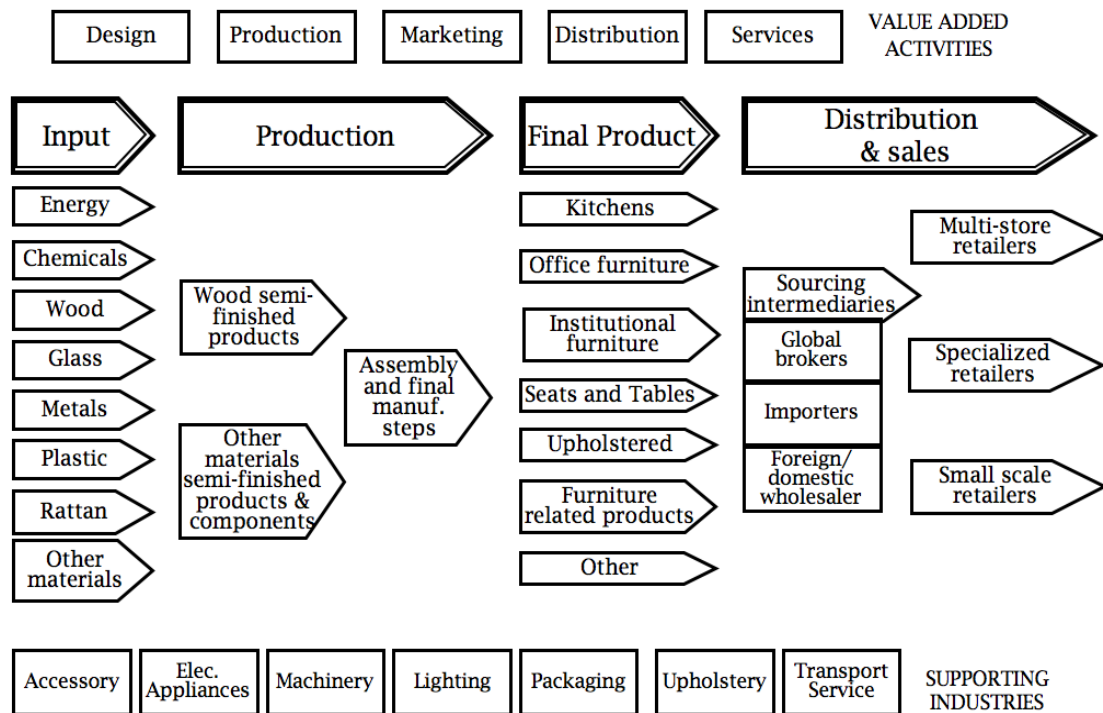
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**Figure 1: The furniture value chain**



Source: our elaboration

**Table 1: Main features of the suppliers interviewed**

Focal firm	First-tier supplier	Second-tier supplier	Manufactured product	Location (province)	Employees	Per cent sales to focal firm
IKEA (2)	Media Profili (1)		Furniture surfaces	Italy (Treviso)	370	<50
	Friulintagli (2)		Furniture surfaces, elements and flat-packed furniture	Italy (Pordenone)	850	<70
	Ilcam (1)		Furniture frontals and components	Italy (Gorizia)	1,480	<10
	Electrolux (3)		Electronic Appliances	Sweden*	51,000	<50
		Eureka (1)	Aluminium doors, elements and furniture structures	Italy (Treviso)	100	
Valcucine (4)	Biesse Crea (1)		Furniture doors	Italy (Pordenone)	20	<50
		Oece (1)	Varnishes and glues	Sweden*	54	
		Tecnospray (1)	Machineries	Italy (Pordenone)	5	
	Eureka (1)		Aluminium doors, elements and furniture structures	Italy (Treviso)	100	<50

Abet Laminati (1)	Decorative laminates	Italy (Cuneo)	758	<10
Electrolux (3)	Electronic Appliances	Sweden*	51,000	<10

In parenthesis, the number of interviews conducted. \* Has a subsidiary in Italy, where interviews have taken place

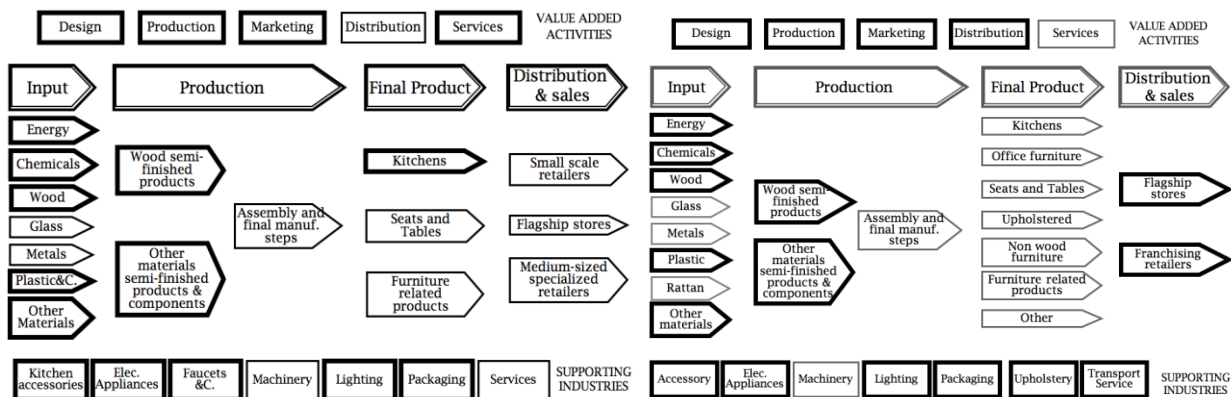
**Table 2: Functions performed in-house, partially outsourced and completely outsourced**

Activities	IKEA		Valcucine	
	Lead firm	Suppliers	Lead firm	Suppliers
Design				
Product development				
Wood processing				
Other-inputs processing				
Wood-furniture manufacturing				
Other-inputs furniture manufacturing				
Assembly and final manufacturing steps <sup>a</sup>				
Marketing				
Distribution				
Retail				

Legend: Dark grey-colored are activities mainly performed in-house; light grey-colored are activities just partially performed in-house; white-colored are activities completely outsourced. Activities are grouped by categories of value -added activities. Both firms rely on logistic suppliers to ship their products to retailers.

<sup>a</sup> IKEA's products are assembled by customers.

**Figure 2: 'Greened' functions in the value chain of IKEA (left) and Valcucine (right)**



Legend: Activities greened by firm are bold-bordered

**Table 3: Main environmental innovations introduced**

VC step	IKEA	Valcucine
Input	Recyclable and recycled raw materials	Recyclable and recycled raw materials, FSC certified wood, dematerialization
Production	Eco-efficiency, Reduction of emissions, use of renewable energy, low emissions	Eco-efficiency, emission compensation, water-borne varnishes

Final product	glues and varnishes, waste management Environmental-friendly accessories	Technical and aesthetic durability, recyclability, environmental-friendly accessories
Distributions & Sales	Distribution model and flat-packaging, eco-packaging, renewable energy, consumer awareness	Eco-packaging, consumer awareness

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