Sustainable development and corporate global strategy: from Vertical to Horizontal efficiency

Michele Pinelli
Department of Management
Ca' Foscari University, Venice, Italy
michelepinelli@unive.it

Abstract. This paper joins the international business literature on corporate global strategy by highlighting a dramatic limitation of mainstream theoretical frameworks that aim to explain the phenomenon of value chain disintegration. These models (e.g. Contractor et al, 2010) usually assume that value chains are doomed to further disintegration along both the organizational and geographical dimension: that is, they assume that the level of offshoring and outsourcing practices are going to indefinitely increase. This paper however remarks that elements related to the paradigm of sustainability (waste minimization, product recovery, reverse logistics, eco-industrial sites, etc.) are pushing business activities one towards the others, therefore increasing the level of geographical proximity of different value chains. The paper therefore suggests that adopting a system-level perspective allows to reveal a core flaw of one of the most ubiquitous assumptions in international business literature: if the unit of analysis stays at the level of single firms or value chains and does not move to an aggregate level, the actual level of value chains dispersion is not captured. In an age in which organizational exchanges are the rule, value chains dispersion is not determined just by how much previously vertically-integrated production processes are disintegrated: instead, their concentration is determined by the degree at which business process once belonging to different value chains are getting in touch with one another.

Keywords: global value chains, global strategy, international business, sustainable development, environmental impact, efficiency, industrial ecology

Introduction

The paradigm of sustainable development is having a strong impact on how firms run their business operations: traditional value creation mechanisms and global value chains configurations are now being challenged (Nidumolu, Prahalad and Rangaswami, 2009). The article points out that internationalization strategy need to be re-thought in order to face the challenges of current economic settings, as sustainability is changing the calculus behind offshoring rationale. Contrary to last decades' mainstream practices and academic theories, recent market evidence is showing that the benefits of value chains' fragmentation and scattering are decreasing. Geographical proximity among activities and value chains' concentration are becoming advantageous due to factors related to sustainable development, namely the increased costs of energy and transportation, the necessities to optimize the use of raw materials, to minimize the production of waste and to strengthen the links with surrounding communities and businesses.

Competitive pressure forced firms to disaggregate value chains both geographically and organizationally in order to reach foreign markets, to procure higher-quality or lower-cost inputs and to establish relationship with new partners (Kedia and Mukherjee, 2009; Thakur and Contractor, 2010). The main driver for activities relocation has always been cost reduction, particularly for poorly-performing firms looking for low-wages employees and low-cost inputs. However some important conditions for the realization of such savings are changing: transportation costs are now much higher than in the past and therefore distant procurement is losing part of its attractiveness; companies now risk higher and higher reputational damages for exploiting poor working conditions or indulgent environmental regulations of developing countries; labor cost, the strongest offshoring motivator, has proven to increase over time; finally, when flexibility and quick time to market are crucial, infrastructural features and human resources' quality matter a lot.

Market evidence suggests that building industrial eco-systems and strengthening the link with surrounding businesses and society is how companies can address the challenge of increased costs of energy and transportation and the quest for the minimization of raw materials consumptions and waste production. The Chinese government for example is experimenting with circular economies and eco-industrial sites in order to overcome main limitations of its industrial system (Fang, Cotè and Qin, 2007): high levels of emissions, high consumption of natural resources' and low productivity. Eco-industrial sites may be firms, aggregates of firms or even cities and provinces, in which different waste-producing processes, plants and consumers are connected into operating webs that minimize the amounts of industrial materials wasted in intermediate processes. The underlying idea is to turn isolated linear chains into cycles characterized by shared activities such as product-recovery processes and reverse logistics. Such closed-loop circular economies involve forward movements of materials (the traditional flows from suppliers to manufacturers) and inverse flows of wastes and by-products (which are collected from manufacturers and consumers). These webs of connected processes create geographically concentrated, hard-to-disintegrate and tightly coupled bundles of activities.

Sustainable development however is not just about optimization of inputs but also about productivity and well-being maximization. Therefore firms not only need to strengthen their relationships with partners but also with their broader ecology: firms' competitiveness is dependent on the health of surrounding communities and on the quality of local institutions and infrastructures (Porter and Kramer, 2011). Developing the local ecology is how firms can foster innovation, productivity and sustainability. This means: investing into local infrastructures; helping under-developed suppliers to have access to financial resources, know-how and better technology; educating local communities; allowing more pleasant working conditions.

The article would clarify the importance of eco-industrial sites building and ecology development by describing how companies like the Chinese Guitang Group and Nestlè's Nespresso arranged their business models.

The article provides significant contributions at both practical and theoretical levels. On the one hand, it helps firms to identify some the most cutting-edge social, environmental and economic challenges of the current context; it warns firms against the assumed (and therefore often not challenged) dogma of "offshoring advantage"; finally, by discussing successful examples of cluster development and eco-industrial sites, it provides firms with possible solutions to the above-mentioned challenges. On the other hand, the article highlights a dramatic limitation of theoretical frameworks incorporating the assumption that value chains are doomed to further disintegration (e.g. Contractor et al, 2010): if the unit of analysis stays at the level of single firms or value chains and does not move to an aggregate level, the actual level of their dispersion is not captured. In an age in which organizational exchanges are the rule, value chains dispersion is not determined just by how much previously vertically-integrated production processes are disintegrated: instead, their concentration is determined by the degree at which business process once belonging to different value chains are getting in touch with one another.

Geographical proximity and horizontal efficiency

It is argued in the paper that the transition from growth to sustainable development implies an increased emphasis on geographical proximity. Such proposition stems from the idea that value is jointly created by groups of actors (Zott, Amit, Massa 2011) and therefore from the notion that firms' performance is dependent on its ecology (Porter and Kramer 2011), in the sense that business performance is also affected by both the quality of local infrastructures and the features of communities and organizations with which relationships are established. Such conceptualization departs from the notions of industrial districts and industrial conglomerates (Porter 1990, 1998) and it merges them in a broader idea of ecology. On the one hand industrial districts such as those observable in Italy and the Californian Silicon Valley consist of geographical concentrations of semi-identical firms, highly specialized, running very similar operations, producing the same kind of product/service, using the same inputs from the same providers and employing the same high-skilled local human resources. On the other hand industrial conglomerates are identified as concentrations of multinational corporations' plants and manufacturing sites that came to the same geographical region in order to exploit local

advantages (such as low-wages, good-quality or low-cost of inputs, efficient infrastructures and state aids) but that share few connections with one another.

Here the idea is that firms can unlock the potential benefits deriving from their surrounding environment exactly because they are different and by leveraging economies of scope and not because they are specialized in the same portion of the same value chain. According to this framework then, companies operating in different industries or businesses are attracted by good local conditions such as human resources' competences or the quality of infrastructures and institutions but they also establish strong exchanges with one another and with the local environment. In this sense, proximity's importance is a consequence of increased transportation costs, of greater relevance of the interconnections and interdependence among activities and between companies and the social-ecological environments in which they are embedded. Such view implies a reconsideration of international business literature, which has so far assumed an association among organizational and geographical dispersion of activities (e.g. Kedia B. L., Mukherjee D., 2009; Contractor et al. 2010), whilst the paper suggests their unbundling: on the one hand, continuously increasing complexity of markets, products and technologies forces firms to specialize their competence and resource bases thus preventing integration and promoting alliances and networking; on the other hand, elements such as reverse logistics, higher transportation costs, minimization of wastes, re-using and re-cycling are reconfiguring value chains by promoting geographical proximity.

Decreasing the level of value chains' geographical dispersion does not necessarily mean that firms will bring all their operations back in their home country but it implies that companies will need to arrange their interdependent activities into coherent and self-reinforcing clusters, which will also have to be wrapped in the local social and ecological environments. For instance, in countries where quick and intense industrial development gave birth to immense sustainability problems such as China, governments and authorities are responding through an increased emphasis on circular economies and eco-industrial areas. Elsewhere, MNCs looking for high-quality natural products such as coffee, tobacco, cocoa, etc. are heavily investing in rural areas of developing countries thus fostering local businesses' productivity, strengthening local infrastructures and developing skills competencies and education of local communities.

Globalization increased distances between firms, suppliers, manufacturers and consumers and made value chains longer and more complicated (Fang, Cotè and Qin 2007; Porter and Kramer 2011). Now competitive pressure and awareness of sustainability issues are raising the need to redesign and reorganize processes and value chains in order to optimize the use of resources and to minimize social-environmental impacts.

Bundling activities in circular economies

It is not new in strategic management literature the idea that firms could experience higher performances by organizing mutually-reinforcing activities in coherent clusters (e.g. Porter 1996; Contractor et al. 2010). Chinese industrial ecology experiments provide a good example of value chains reconfiguration in tightly-coupled sets of coherent and

interdependent processes. The country experienced in few decades the industrial development that took almost two hundred years in western countries (Kiujis, Wang, 2006). Drawing from the notion of time compression diseconomies (Dierickx and Cool, 1989), it is immediate to infer that such tremendous pace of growth came with substantial social and ecological repercussions. Chinese economy indeed is characterized by high levels of emissions and natural resources' consumption and by low efficiency of the productive processes: indeed although China consumes respectively the 7%, 30%, 31%, 27%, 25% and 20% of global consumption of oil, coal, iron-ore, steel, alumina and cement, the corresponding GDP is just the 4% of the world (Fang, Cotè and Qin 2007); Chinese pollution is by now a serious threat as contaminated water and solid waste per unit of GDP are much higher than in developed countries; widening inequality among the incomes of urban and rural areas are sources of social tension (Kiujis, Wang, 2006).
In order to cope with such weaknesses of its industrial structure, Chinese government has officially committed to sustainable development (e.g. all round better off society act, energy economization law, cleaner production promotion law, etc.) and is experimenting new ways to increase social well-being and to optimize energy and resource consumption through circular economies, eco-industrial sites and ICTs investments. Eco-industrial sites, which may be firms, aggregates of firms, cities or provinces, aim at finding ways to connect different waste-producing processes, plants, industries and consumers into operating webs which minimize the amounts of industrial materials wasted in intermediate processes. In these areas networks of firms and local communities try to realize symbiotic production lines and recycling webs by redesigning and reorganizing processes and by sharing material and energy flows and technologies: the basic idea is to turn linear chains into cycles or closed-loops supply chains characterized by shared activities such as product-recovery processes and reverse logistics. Fostering circular economies means establishing networks between businesses and communities in order to realize an eco-efficient use of resources through the adoption of cleaner production and through the re-using and re-cycling of by-products from other subjects as raw materials. Closed loops for circular economies involve forward movements of materials (traditional flows from suppliers to manufacturers and end users) and inverse flows of wastes and byproducts (collected by re-manufacturers from processors, manufacturers and end-users or consumers).

Realizing such webs of interrelated sub-processes requires substantial value chain configuration: on the one hand, ad-hoc activities such as asset management, facility re-designing, product planning, new inventory practices, life cycle assessment (LCA), and material flow analysis (MFA) have to be designed as shared activities for the whole eco-industrial site; on the other hand, the degree of value chain's geographical dispersion needs to be reduced in order to realize hard-to-disintegrate, tightly coupled, modular bundles of activities. In other words, since leveraging the complementarity of different activities means designing more complex and interdependent value chains, the notion of joint-value creation results stressed even further.

Fang, Cotè and Qin (2007) provide a nice example of eco-industrial sites by describing Guigang group, a big Chinese corporation operating in many businesses, the main of which is sugar making. When the recession of sugar industry put the company's

survival at serious risk, it reacted creating an industrial eco-system with the purpose of reducing raw material consumption, energy costs, waste management costs and environmental compliance costs; the firm also worked to strengthen the environmental image of the group in order to operate in green markets. Initially the Guigang group produced only sugar but today its business has extended to include paper, alcohol, cement alkali and fertilizer, whose production is based on the by-products of sugar-making processes. The circular value chain is a web of activities designed around two main production processes sugar and paper. Along each of these chains every down-stream plant uses as raw materials the by-products of up-stream plants. In this way plants producing paper, alcohol, compounds and fertilizer are alimented with inputs from the sugar-making processes whilst cements are made from paper-making by-products.

Eco-coherent bundles of activities in geographically concentrated value chains

International business literature broadly agrees that competition and globalization forced firms to disaggregate value chains both geographically (offshoring) and organizationally (outsourcing) in order to reach foreign markets, to procure higher-quality or lower-cost inputs and to establish relationship with valuable partners. Consequently, a corporate global strategy is concerned with decisions about the optimal level of value chains' shattering and the organizational and geographical allocation of resulting fragments (Contractor et al., 2010), the general bottom-line being that core activities are kept in-house and the rest dispersed wherever is best.

Although general relocation initially involved mostly non-core activities such as IT services and manufacturing, with time even core processes such as R&D, product design, engineering and marketing have been further separated into essential sub-processes to be retained and operational sub-processes that can be outsourced. Also, the market for business process outsourcing has been favored by: companies' need to specialize and to dedicate resources to the activities essential for the competitive advantage; the quest for legitimacy in strategic markets; the flourishing of more specialized and sophisticated offerings from always more efficient providers; the codification of corporate knowledge (Contractor et al., 2010).

Since such trends result in an increasing share of value added externally by other firms and in a reduction of global total costs, they emphasize two key findings: first that value is jointly created by groups of actors and second that the key pillar on which outsourcing is built is the exploitation of suppliers' economies of scale and competences. Although some scholars have remarked that firms' boundaries are becoming more permeable and tend to shrink organizationally and to expand geographically (Contractor et al. 2010), this paper suggests that value chains' concentration and geographical proximity among activities will become increasingly important due to factors related to sustainable development, namely the increased costs of energy and transportation, the necessity to optimize the use of raw materials, to minimize the production of waste and to strengthen the links with surrounding communities and businesses.

It is important to understand how the elements traditionally behind outsourcing and offshoring decisions are going to be affected by the emergent paradigm of sustainability. The most influencing driver for activities relocation has always been cost

reduction, particularly for poorly-performing firms looking for low-wages employees and low-cost inputs (Thakur and Contractor, 2010). Although costs savings are essentials, it is to notice that some of the basic conditions for the realization of such economies are changing: first transportation costs are now much higher than in the past and thus distant procurement is losing part of its attractiveness; second, the reputational damage for exploiting developing countries poor working conditions or the indulgent environmental regulations may offset any short-term saving; third, labor cost, that is a strong offshoring motivator as it is the a big share of many firms' operational costs, tends to increase with time. Lastly infrastructures' features and human resources' quality matter a lot when flexibility and quick time to market are relevant, which is precisely the case of contemporary economy: although evidence is increasingly showing that emergent markets are becoming less imperfect and employees there have often better qualifications than their counterparts in America and Europe (Kedia and Lahiri 2007), which are facing deficiencies of skilled professionals in knowledge-intensive sectors.

As products, markets and technologies are increasingly complex it is more difficult for organizations to control all the competences and diverse components of knowledge needed to realize their production. Thus the need to access external expertise and knowledge inputs is another important driver for outsourcing decisions. Since technologies and markets are not becoming any simpler and since firms are retaining in-house fewer and fewer processes while acquiring the rest on the markets, it is reasonable to assume that this trend would not be inverted by the paradigm of sustainability. On the contrary, as sustainable development implies marked emphasis on activities' interconnections and non-immediate repercussions, links among firms and between firms and institutions will get stronger, more frequent and will involve new aspects of doing business. Moreover, such increased embeddedness of companies in the locations where they will establish their operations will positively contribute to reach other goals of offshoring strategies: building legitimacy among local customers and institutions and gathering intelligence about unknown markets.

Another important element to be considered when decisions about activities' allocation are to be made is that value chains fragmentation and dispersion raise the level of complexity and the cost of coordination: each time a new geographical market is approached information is to be acquired about possible partners, culture, work habits, institutional environment and where to establish plants; additionally, although ICTs and globalization significantly reduced communication costs, cultural and institutional distance still represent an obstacle to economic exchanges.

In order to understand how sustainable development will affect global value chains configurations, it is useful to consider the framework that Kedia and Mukherjee (2009) provide for explaining corporate global strategy decisions, which are based on disintegration advantages, location-specific procurement benefits and incentives for externalization.

The disintegration of production processes and the unbundling of non-core functions are generated by the need for different knowledge bases, managerial styles and incentive structures (Jacobides 2005) and they may lead to several benefits: hierarchical

coordination costs reduction, resource allocation on core capabilities and establishment of more flexible and responsive modular structures.

Location has long-time being identified as a major determinant for FDIs (Dunning 1977) and so it is for global strategy decisions as it may lead to advantages related to the territory (infrastructures, country risk, investment-friendly policies, cheap natural resources, market size, transportation costs, taxation, structure of competition) or to the people living in it (low wages, labor productivity, cultural similarity, quality of human resources, skills and competencies, exploitation of different time zones) Externalization is based on the ideas that some activities are general in nature and can be decoupled from their value chains (Jacobides and Winter 2005) and that suppliers can achieve economies of scale and specialization that clients cannot. In this way, value is jointly created (Zott, Amit and Massa 2010) and mutual trust and shared values allow extracting relational rents from good partnership relationships (Dyer and Singh, 1998). Globalization and technological advancements have favored offshoring because ,by reducing geographical and cultural barriers, they increased the offer of human capital, raw materials, semi-products and potential partners and, because of the augmented rivalry from international players from emerging markets, they also amplified the competitive pressure. Such scenario changed the advantages of activities internalization and the market of global resources: for instance the complexity of markets, products and technologies increased the coordination costs of vertical integration whilst cooperative organization forms reduced the need for it; at the same time ICTs made cross border coordination cheaper and emerging countries are becoming more interesting product, labor and capital markets with less barriers and tariffs to trade and they are plenty of human capital and firms with superior resource and competence bases; finally the always increasing level of rivalry is forcing firms to specialize in core activities. As a result not only MNCs but all small and medium-sized firms reacted by shattering their value chains, relocating process away, shifting resources in higher value-added activities and looking for resources in the global market. Consequently the business process outsourcing market has grown fastly, many jobs have been offshored and cooperation through alliances, joint venture, etc. at various organizational levels has become enormously more frequent (Danskin, Dibrell and Kedia 2005).

It is to remark that literature on international business tends to analyze offshoring and outsourcing practices at the same time and to assume an association between geographical and organizational dispersion (e.g. Kedia and Mukherjee 2009; Contractor et al.2010; Thakur and Contractor, 2010). In such frameworks are usually present a dichotomist geographical variable (onshore versus offshore location) and a discrete organizational variable (spacing from vertical integration to market transactions) which, depending on the specific benefits and costs of dispersion, result in a specific optimal global strategy (in-house development, domestic outsourcing, off-shore outsourcing, global insourcing, etc.). Stemming from this paper contributions, namely the sustainability-driven push towards activities' integration in eco-consistent bundles and the importance of their trophic embeddedness in the local ecology, emerge two limitations of such frameworks: first, the increased emphasis on activities' interdependence is amplifying the importance of geographical proximity of business

processes therefore separating the so-far assumed association between geographical and organizational dispersion; second, as these frameworks is a single firm or value chain, they fail to capture the way in which different value chains interact, intertwine and overlap with one another therefore missing the actual level of their disintegration and concentration. Indeed, in an age in which organizational exchanges is the new normal, the concentration and dispersion of value chains is not determined just by how much previously vertically-integrated production processes are disintegrated: instead, they are also very much characterized by the degree in which business process once belonging to separated value chains are now getting in touch with one another. All in all, dispersed and isolated production systems and distant procurement are becoming much less advantageous and business operations will start to be ran into fewer bigger highly-integrated production sites (Porter and Kramer 2011).

Conclusions

The paper has argued that sustainable development puts more emphasis on activities' interdependency and complementarity; and that the disadvantages of distant procurement and the pressure for eco-efficiency are going to deeply affect value chains configuration. Such factors are challenging the assumed trend on value chains' disintegration: so far management literature has considered organizational and geographical dispersion as tied together and doomed to increase. However, although market, product and organizational complexity is going to keep forcing firms to increase their focus on core-areas therefore increasing organizational dispersion, at the same time geographical concentration is being promoted by the increasing costs of distant procurement and transportation and by the benefits stemming from deeper bonds with surrounding communities and businesses. Shifting the unit of analysis from individual value chains to aggregates of value chains, it is possible to recognize that activities will be re-combined into eco-coherent clusters embedded in their ecology.

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