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Dimensions of Sustainable Value Chains: Implications for Value Chain Analysis

Andrew Fearne & Marian Garcia

Kent Business School, University of Kent

Ben Dent

School of Integrated Systems, University of Queensland

Abstract

Purpose – Value Chain Analysis (VCA) can expose strategic and operational misalignments within chains, and the consequential misallocation of resources, and hence opportunities for improvements which create value and economic sustainability. This paper's purpose is to argue why and how VCA needs to integrate the social and environmental aspects of sustainability in pursuit of sustainable competitive advantage.

Design/methodology/approach – Based on a review of existing methods and case studies, the paper proposes three dimensions of VCA, which illustrate the flaws in narrow tools, and the need to broaden the boundaries of VCA, the interpretation of 'value' and relationships along the chain in order to highlight opportunities for creating sustainable value chains.

Findings – To date VCA has largely focused on economic sustainability and paid inadequate attention to social and environment consequences of firm behaviour and the (re) allocation of resources within and between firms in the chain. This risks producing recommendations which either ignore the competitive advantage offered from improving environmental management and social welfare, or have such detrimental external consequences as to render any proposals unsustainable when exposed to government or broader (public) scrutiny.

Research implications – VCA variants need to be developed which incorporate all three pillars of sustainability. Some initial experiences are presented and ideas for future research and applications proposed.

Practical implications – The development of sustainable VCA tools should identify business opportunities consistent with Porter and Kramer's (2011) imperative for value chains to create shared value between business and society.

Originality/value – Adopting the broader dimensions identified will allow VCA to become more widely applicable, and more relevant in business scenarios where there is a growing imperative to include social and environmental impacts into 'mainstream' business strategies.

Key words: Value Chain Analysis, Sustainability, Shared Value, Social and Environmental Sustainability

Introduction

Porter and Kramer (2011) updated concept of 'shared value creation' – value that is mutually beneficial to both the value chain and society, reflects a number of trends in strategic management and value chain research. A narrow focus on efficiency may result in reducing waste and costs but is unlikely to create any additional value. In addition, there is growing interest in looking beyond internal economic costs and benefits to investigate why and how to incorporate broader societal costs and benefits in ways which contribute to long term (sustainable) competitive advantage. Increasingly, Government, civil society and special interest groups are holding businesses accountable for their negative environmental and social impacts, challenging the sustainability of corporate strategies built on self-interest and an insular view of the world and organisational impacts thereon. This is reflected in the growing emphasis on life cycle management, where supply chains rather than firms are held accountable for a product or service's external impacts. There is also recognition that failure to create shared value leaves government and civil society to mitigate the negative impacts of business in trying to build sustainable societies, regions and nation states.

This paper builds on the concept of sustainable value chains (Fearne 2009), from which a framework for sustainable value chain analysis (SVCA) emerges to encompass environmental and social impacts within a collaborative model of value chain management. It explores the dimensions on which SVCA should focus and illustrates how and why taking broader perspectives ensures a chain's internal economic sustainability is compatible with its external socio-environmental consequences. The paper concludes with research implications for designing tools to support strategic frameworks for achieving sustainable competitive advantage.

Value chains and the evolution of value chain analysis

Porter (1985) uses the term 'value chain' to describe a series of value-adding activities. This series consists of primary activities, related directly to manufacture, sales and distribution, and secondary activities which support primary activities, such as planning, finance, R&D and human resources. This disaggregation of functions can also be applied to an inter-firm system, from raw material inputs to consumption (Shank and Govindarajan 1992, McGuffog and Wadsley, 1999).

Value chain thinking is distinctive from supply chain thinking (Table 1) and provides the enabling (internal) business environment for the development of sustainable competitive advantage (Hopkins, 2010). This is because the (more effective) sharing of information within and between organisations in the chain contributes to better decision-making and resource allocation, and when a chain acts in partnership to develop systems and products defined fundamentally by consumer preferences, they become much more difficult for competitors to imitate (Fearne 2009).

Table 1 – A comparison between supply chain thinking and value chain thinking

	Objectives	Material Flow	Information	Relationships
Supply chain thinking (Suitable for commodities and commodity markets)	Reduce costs, increase margins and increase market share	Focus on efficiency, market access and increased distribution	Protected and perceived as a source of arbitrage. Exchange restricted to transactional data	Arm's Length. Focus on supply chain efficiency, leveraging scale and market power to secure favourable terms of trade
Value chain thinking (suitable for differentiated products and segmented markets)	Add value and segment the market with differentiated products designed to increase profitability at all stages in the chain	Focus on quality, service and agility with distribution determined by consumer demand rather than capacity utilisation	Shared and perceived as a source of competitive advantage. Strategic information shared with trusted partners	Collaborative. Focus on supply chain resilience, shared resource allocation, shared risk and shared benefits.

Adapted from Fearne (2009)

Such thinking is implemented through value chain management. As Bonney et al. (2007) argue, the characteristics of value chain management are the pursuit of a shared vision through aligned strategies, structures and processes, based on trust, open communication, a commitment to continuous improvement, an understanding of what consumers value in the product, and a clear focus on creating that value throughout the chain. This results in mutual benefits from the creation, realisation and flow of value along the chain. Such strategic alignment along a chain requires a common strategy amongst the main partners, and its execution across key functions (Gattorna, 2006; Fearne *et al.*, 2008).

VCA is a tool for examining the current state of the chain and identifying an improved future state. It has similarities with value streaming mapping (VSM), a tool developed by Jones and Womack (Womack *et al.*, 1990; Womack and Jones, 1996; Jones and Womack, 2002), and applied in the context of lean manufacturing by Hines and Rich (1997) and Rother and Shook (1998). VSM focuses on the material and information flow within and between firms, and contributes to competitiveness by encouraging the application of lean thinking, in which products are pulled through chains in response to demand, with minimal waste and inventory. It primarily takes a cost-based view of value, focusing on the drivers of efficiency and waste (Hines *et al.*, 2004). VCA is also concerned with the elimination of waste and the efficient flow of materials, but contains an additional feature, the strength of inter-organisational relationships (Taylor 2005). Moreover, the primary focus of VSM is the manufacturing process whereas VCA extends the line of sight to include input suppliers and service providers and their contribution to the creation of value and the generation of waste.

Dimensions of Value Chain Analysis

This paper argues that to be relevant to the current business context, existing approaches to VCA needs to adopt more holistic (sustainable) perspectives. These include addressing external factors, such as health, environmental damage and poverty, which can offer opportunities for a chain to create shared value (Porter and Kramer 2011). To identify these perspectives, we propose three dimensions which researchers can use to ensure that VCA contributes to sustainable value creation and reflect on the extent to which these dimensions are present in the twenty four VCA studies published to date (see Appendix A).

Dimension 1 - Boundary of analysis: Intra-firm → inter-firm/chain → external stakeholders

The first dimension addresses the boundary of analysis. This is significant because competition is increasingly between supply chains rather than between firms. Supply chains are being held accountable for their members' collective environmental and social impacts, and external stakeholders are influential in creating value.

Many of the VCA studies published to date have taken an intra-firm perspective (Dekker 2003), reflecting Porter's (1985) original conception of a value chain as a dis-aggregation of a firm's internal functions. However, a shift in competition from between firms to between supply chains (Lambert and Cooper, 2000) has led to a paradigm shift, from an attitude of maintaining minimum dependency on suppliers and customers in order to maximise the scope for leverage over price, to mutual leveraging of skills and resources from across the supply chain to deliver both efficiency and effectiveness (Spekman *et al.*, 1998). Thus, value chains are increasingly seen as a system of multiple firms (Pandelica, 2009) in which each understands and responds

to the dynamic needs of customers beyond their immediate dyadic relationships (Horvath, 2001). This avoids a sequential view of activities, and generates a unified strategy along the whole chain (McGuffog and Wadsley, 1999). Consequently, suppliers benefit from long term partnerships by allocating their resources more productively, and reducing costs through greater continuity in planning; and customers benefit from greater influence over suppliers (Pesonen, 2001).

This need for an inter-firm boundary also reflects that supply chains, rather than individual firms, increasingly are being held accountable for their environmental and social performance, with governments, retailers, consumers and NGOs/activists adopting life cycle perspectives (Seuring *et al.*, 2008b; Ciliberti *et al.*, 2008, Berns *et al.*, 2009). Such requirements are driving more co-operation between firms in supply chains (Seuring, 2004; Sharfman *et al.*, 2009), for example with environmental management integrated into product development, marketing and distribution to remove negative impacts or to develop new products with lower impacts (Hart, 1995; Pesonen 2001). Accordingly, while the primary target may be the manufacturer, governments', retailers' and consumers' demands are transmitted upstream to suppliers, often causing brand owners to look further up their supply chains than normally required for commercial reasons because they are being held responsible for the entire product life cycle (Seuring and Muller, 2008a). This requires greater stability and transparency within the chain to ensure claims or requirements on environmental performance can be verified (Hagelaar and van der Vorst, 2003), and ultimately, "intra-value chain co-operation would appear to be a fundamental element of any environmental strategy" (Lamming and Hampson, 1996, p53).

While the need for an inter-firm perspective is widely accepted and followed, a sustainable VCA should expand the analysis outside the supplier-customer-consumer boundary. For example, the environmental VCA proposed by Rose and Stevels (2000) and Rose *et al.* (2000) extends the boundary of the material flow to incorporate end-of-life product management. The unit of analysis may even need to include external stakeholders, who, though not part of the material flow, can be part of critical information flows and relationships (Donaldson *et al.*, 2006). Comprising governments, NGOs and communities (Freeman, 1984; Clarkson, 1995), such stakeholders provide infrastructure, regulations and social context which facilitate the creation of value. For example, governments can introduce regulations that a chain would find costly to meet (Laszlo, 2008), or they can be influenced towards regulations tailored to the chain's unique capabilities, and so create competitive advantage by increasing competitors' relative costs (Hart, 1995; Reinhardt, 2000).

Dimension 2 - Scope of value considered: cost/waste reduction → consumer and customer value → shared value

The second dimension reflects the breadth of sources and beneficiaries of value created by the chain. While VCA originates in the management of operations, Shank and Govindarajan (1992) argue that value-added is not just price recovered minus costs incurred, and, along with Dekker (2003), state that VCA should also look at activities as potential sources of differentiation, and so distinguish between VCA that focuses narrowly on efficiency and that which extends to effectiveness (Zakaei and Simons 2006). This effectiveness traditionally concerns creating value for customers and consumers, which is considered first, but also needs to encompass shared value with the wider community.

The majority of VCA studies published to date incorporate the notion of customer value. Since products require market access, upstream producers and processors need to engage intermediaries by offering sufficient customer value (Woodruff, 1997; Holbrook, 1999; Payne and Holt, 1999). Woodruff (1999, p142) defines customer value as “the perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations.” VCA must be dynamic, as the attributes used to judge value, and their relative importance, will change as the supplier-customer relationship deepens (Parasuraman, 1999). Further, central to the chain perspective of VCA boundaries, customer value must be considered across indirect relationships, beyond a succession of dyads. Creating superior value relies on the seller understanding the buyer's entire value chain, and its changing needs (Slater *et al.*, 1994; Horvath, 2001), since value realisation involves transforming potential benefits into actual ones (Ramsay 2005), which may occur only after several downstream transactions.

Some VCA studies have also incorporated an assessment of consumer value, because consumers have exclusive rights to define what constitutes value in a product or service (Slater and Narver, 1992), since, in the absence of government subsidies, they are the sole source of payments into a value chain (Cox, 1999; Priem, 2007). Accordingly, the potential amount of value which can flow along the chain is dependent on creating and then realising consumer value, and so understanding the product's value in the eyes of the consumer is critical (Fearne, 2009). More consumer value is created when a consumer either buys the product for first the time; is willing to pay more; buys more frequently and/or establishes deeper brand loyalty (Reinhardt, 2000; Priem, 2007; Bonini *et al.*, 2009). Consumer value can be derived from experiencing the product, or from credence attributes, such as many environmental and social sustainability attributes (Reinhardt, 2000). Consequently, a sustainable VCA needs to explore how activities and attributes affect consumer behaviour, recognising that individuals assess a product's attributes differently, reflecting, amongst other things, their culture, gender and socio-

economic characteristics – which affects their ability to pay, aside from their willingness to pay - and ethics (Rozin, 2007). Accordingly, VCA should identify and work within distinct market segments, rather than treating consumers as a homogenous group (Vermeir and Verbeke, 2008).

However, within VCA, customer and individual consumer value may be insufficient to identify the full scope of value available. Holbrook (1999) argues that consumer value extends to collective utility, as well as individual utility, and hence to society as a whole. These externalities can have a significant impact on a chain's competitiveness, and so should be incorporated within the scope of value considered. For example, they may affect its social legitimacy (Bozeman, 1987; Hart, 1995) and corporate reputation (Bhaskaran *et al.*, 2006, Hoffman and Woody, 2008), or reveal opportunities for new products and markets or means of improving productivity (Porter and Kramer 2011).

Dimension 3 - Governance: Relationships not considered → Channel power → collaboration

The third dimension considers governance, which Gereffi defines as “authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain” (1994, p97). In some of the published VCA studies, relationships are investigated only to the point of identifying the existence of the flow of material and information. However, it is their potential for nurturing greater collaboration which is critical to developing innovation and competitiveness from value chain management (Bonney *et al* 2007), since structural and behavioural mechanisms are pre-requisites for creating value across functions and boundaries (Jayaram *et al.*, 2004), including a willingness to suspend self-interest for the longer term good of the relationship (Ernst and Bleeke, 1993). Building such alliances as they transition from open market negotiations, through co-operation to co-ordination and finally collaboration confers sustainable competitive advantage because they require capabilities and resources which competitors may not possess, cannot be traded and are hard to imitate because they are socially complex, causally ambiguous and developed through unique histories (Spekman *et al.*, 1998; Gold *et al.*, 2009; Barney and Hesterly, 2010).

Accordingly, this dimension contrasts VCA studies which ignore relationships from those that determine whether they are dominated by the appropriation of value through the application of channel power (Cox 1999, Vermeulen and Seuring 2009) to those which assess whether firms collectively have the resources and competences necessary to form and sustain collaborative relationships driven by the creation and flow of value. Accordingly, including the broader perspective will ensure that improvement projects emerging from a VCA deliver mutual benefits which will maintain the motivation and commitment of relevant trading partners. This dimension

also recognises that relationships are critical to value distribution, which is one means of enhancing a chain's social sustainability (Fritter and Kaplinsky, 2001).

Conclusions and Recommendations for Further Research

Porter and Kramer (2011) distinguish shared value from both sustainability and corporate social responsibility. The former, they characterise as coming at the expense of a firm's economic performance and having intangible or undefined consequences; the latter is interpreted as a discretionary activity, driven by external factors and internal personal preferences. They argue that shared value is based on mutual, positive economic and societal benefits relative to costs, and hence integral to long term competitiveness. This paper has proposed how VCA can be adapted to include additional perspectives which incorporate shared value and look beyond the chain's internal stakeholders, with collaboration as a means to sustainable competitive advantage. Our review of existing VCA studies revealed showed that none adequately reflect these additional perspectives, and that to do so would require greater clarity on the metrics of shared value, and its relationships with customer and consumer value.

One of the studies to get close to achieving this goal closest is the one by Fearne et al (2009), which looks at the wine value chain, from (drought-stricken) South Australia to the UK – the world's largest importer of Australian wine and a leading protagonist in the fight for more sustainable lifestyle, societies, production processes and supply chains. The key features of this study are:

- The identification of the main activities along the chain, and their contribution towards value creation;
- The assessment of information flows and the use of collective decision-making informed by appropriate evidence
- The evaluation of relationship strength, the foundation for strategic alignment, trust and commitment.
- The assessment of carbon emissions at each stage of the chain, from input supply to final consumption.

The incorporation of the value chain's carbon emissions via a life cycle analysis highlighted the need for a more comprehensive notion of value when identifying the sources and beneficiaries of value derived from more socially and environmentally sustainable activities.

This experience raises two key questions that VCA researchers need to consider in the future. The first is 'what metrics should be used for shared value and how can we ensure these are consistent for different stakeholders along the chain'? As a diagnostic, the method used by Fearne *et al* (2009) employed quantitative data for measuring emissions, but a qualitative

approach towards allocating the sources of consumer value along the material flow. Activities were classified as simply those that add value in the eyes of the final consumer; those that are necessary but non value-adding, and those that are wasteful. This approach could be extended to diagnose the creation of shared value, to highlight where and how shared value is created, especially value from outside the immediate chain. However, this requires clarity over the identification of where shared value is created and the significance thereof, relative to consumer value or customer value. Without this insight, managers may struggle to prioritise improvement projects.

The second key question is 'how can we integrate customer and consumer value'? As discussed, these are critical drivers of behaviour in the chain and unless activities which create shared value also contribute to consumer and customer value, then chains will revert to supply chain thinking, and the potential for shared value will not extend beyond identifying opportunities for more efficient resource use within firms (King and Menox, 2001; Winston, 2009). Rather, improvement projects emerging from a VCA will need to satisfy the needs of consumers and customers, while also creating value to wider society.

Appendix A: Summary of published VCA studies

Paper	Method or case study	Sector	Dimensions		
			Boundary of analysis	Scope of value	Governance
Womack <i>et al</i> (1990), Womack and Jones (1996)	Method	Multiple	Inter-firm	Customer	Not considered
Hines and Rich (1997)	Method and case study	Multiple	Inter-firm	Undefined	Not considered
Rother and Shook (1998)	Method	Multiple	Intra-firm	Internal cost/waste	Not considered
Rose and Stevels (2000); Rose <i>et al</i> (2000)	Method and case study	Electronics	Inter-firm	Customer & consumer. Environmental impacts measured but no shared value creation	Not considered
Jones and Womack (2002)	Method	Multiple	Inter-firm	Customer	Not considered
Kaplinsky and Morris (2002)	Method	Multiple	Inter-firm	Customer and consumer	Collaboration
Dekker (2003)	Case study	Food	Inter-firm	Customer	Collaboration
Simons <i>et al</i> (2003)	Method and case study	Agrifood	Inter-firm	Consumer	Collaboration
Agriculture and Food Council of Alberta (2004)	Method	Agrifood	Inter-firm	Customer and consumer	Collaboration
Dolan and Humphrey (2004)	Case study	Agrifood/development	Inter-firm	Customer	Considered without preference
Hines <i>et al</i> (2004)	Method	Multiple	Inter-firm	Customer	Not considered
Taylor (2005)	Method	Agrifood	Inter-firm	Customer	Collaboration
Donaldson <i>et al</i> (2006)	Method and case study	Healthcare and agrifood	Inter-firm	Customer and consumer	Not considered
Lummus <i>et al</i> (2006)	Case study	Healthcare	Intra-firm	Internal cost/waste and customer	Not considered
Abdulmalek and Rajgopal (2007)	Case study	Manufacturing	Intra-firm	Internal cost/waste	Not considered
Bonney <i>et al</i> (2007)	Method and case study	Agrifood	Inter-firm	Consumer	Collaboration
Da Silva and de Souza Filho	Method	Agrifood	Inter-firm	Consumer	Collaboration

(2007)					
Elloumi (2008)	Case study	Education	Inter-firm	Consumer	Not considered
Fearne <i>et al</i> (2008)	Case study	Agrifood	Inter-firm	Consumer	Collaboration
Roztockki and Weistroffer (2008)	Method and case study	Services	Intra-firm	Internal (revenue minus costs)	Not considered
Seth <i>et al</i> (2008)	Case study	Agrifood	Inter-firm	Customer	Not considered
Clark <i>et al</i> (2009)	Case study	Agrifood	Inter-firm	Consumer	Collaboration
Faße <i>et al</i> (2009)	Method	Multiple	External stakeholders	Environmental impacts measured but no shared value creation	Considered with reference to Game Theory
Fearne <i>et al</i> (2009); Dent <i>et al</i> (2009)	Method and case study	Agrifood	Inter-firm	Consumer. Environmental impacts measured but no shared value creation	Collaboration
Gooch <i>et al</i> (2009)	Case study	Agrifood	Inter-firm	Consumer	Collaboration

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