Green Supply Chain & Profitability: A Case Study of Two Multinational Companies

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Abstract

Now-a-days, companies are focusing more on adopting various aspects that help in running more sustainable businesses and also combining compliance with saving costs and increasing profitability. With the recent tendency to increase profitability through more integrated supply chain management, researchers have been working on developing measures to incorporate a greener and more sustainable approach into companies' supply chains. The main concern for many companies is how to measure and track the successful implementation of a green supply chain. Green supply chain management is still not a formalised managerial practice in the standard management literature,yet more companies will discover the benefits of going green, mostly multinational companies who, due to their sheer production capacities and usage of raw materials, have traditionally been among the largest emitters of pollutants into air and water.

This paper is an attempt to find out whether green supply chain is an effective tool for gaining profitability. To fulfill this purpose a comparative study has been made in between two multinational companies. The outcomes of this study provide an adequate amount of evidences and motivation for companies to go green and to becomefinancially stable simultaneously.

Keywords: Green Supply Chain, Environmental Management, Profitability

Introduction

Green supply chain management (GSCM) is an approach that aims at the overall optimisation of material and information flows along the value chain. The main aspect is a stronger focus on ecological and sociological aspects when making managerial decisions. Companies should rethink the way they plan to do business in the future to stay profitable. Making sustainability a priority in managerial decisions is more than dealing with risk and uncertainty.

Sustainability offers companies opportunities to save costs, increase efficiency and gain new customers and suppliers. Even further, it incorporates the potential to gain a competitive advantage and to generate profits. This affects all areas of an enterprise, but is especially true for emission and waste heavy supply chains. A company focusing on this so-called triple bottom line through sustainability needs to investigate and apply changes to all upstream and downstream areas of its supply chain, as well as, incorporate external stakeholders. This challenge brings up strategic and operational questions that need to be reflected in a supply chain strategy. To demonstrate the impact the electronic industry alone has on the environment (Skjott-Larsen, 2008):

- The United Nations (UN) estimates that 20–50 million tons of e-wastes are generated worldwide each year and less than 20% of which is captured by recycling programs.
- In 2007, about 1.1 billion mobile phones were sold worldwide-50% of the world's population (6.6 billion) has a mobile phone.
- The European Union (EU) produces 8.7 million tons of e-waste every year. Large amounts are exported to Asia and Africa in spite of the Organisation for Economic Co-operation and Development (OECD) and EU ban of export of e-waste.

As a result of this evident impact, we ask the questions: Why should companies care? What are the advantages and benefits? How is it possible to measure the success of a more environmentally friendly way of doing business? Can companies manage uncertainty and incomplete information and remain sustainable? Possible answers include among others:

- Global warming: Negative effects on our environment directly or indirectly affect earth's eco-environment.
- International regulation and legislation: The EU forces companies to comply in order to stay in these markets.
- Brand reputation: The lack of environmental policies results in negative publicity.
- Stakeholders' increasing awareness: Positive image often is more desirable than pure shareholder value thinking.
- Energy and commodity prices: fluctuations in oil, energy, and raw material prices are partially driven through increasing demand in countries like China.
- Potential value creation in green supply chain: seeing opportunities to create value and competitive advantages.
- More integrated and better managed supply chains: Supply chain partners have increased visibility to each others' practices through supplier prequalification, environment and social requirements early in the relationship, cross enterprise materials and process optimisation and industry standardisation.

Despite the overwhelming evidence that the current rate of consumption will lead to a business environment where resources will be scarce and therefore far more expensive to obtain, companies are not changing their operations. The current paper will provide a simple framework to show how companies can implement changes and then track the benefits. It applies this model in two case studies, Coca-Cola, a leader in global sustainability, and Apple, a company that has only recently started to develop a sustainability strategy. The results of the present study demonstrate that eliminating waste throughout the supply chain will not only address the concerns of the government, investors and customers, but will also make the supply chain more profitable, thus creating an incentive for companies to take action. The final part of the current paper presents a discussion and an outlook on future developments in GSCM.

Green Supply Chain

Supply chain management is the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole (Christopher, 1992). Thus a supply chain manages information, product, service, financial, and knowledge flows from the supplier network to the integrated enterprise down to the distribution network and finally to the end customers (Bowersox *et al.*, 2002). Typical functions within a supply chain involve purchasing/material sourcing, manufacturing/material management and distribution/material transport. Thus, when putting the involved functions into a more environmental and thus sustainable 'green' context, GSCM can be seen as the sum of green purchasing, manufacturing/materials management, distribution/marketing and reverse logistics (Hervani *et al.*, 2005). However, the green supply chain approach goes much further than just attempting compliance with environmental regulations. Investments in GSCM can save resources eliminate waste and improve productivity (Porter & Van Der Linde, 1995a, 1995b). Also, integrating environmental and supply chain management can potentially reduce costs and increase efficiency and flexibility (Wilkerson, 2005). Furthermore, this can ideally lead to the identification and creation of new opportunities for products and services in cooperation with up-stream and down-stream partners, and the involvement of internal and external stakeholders in decision making on supply chain matters (Kummer *et al.*, 2006).

Case Study: Apple Inc

Apple Inc. is a company with a strong name in the computer and consumer industries. Founded in 1977, becoming a leader in the computer industry soon after, the company went through a re-innovation phase starting in the late 1990s with the return of Steve Jobs. With the introduction and tremendous success of the iPod, Apple marked its entry into the consumer electronics business. The company focuses on the design and marketing of its hardware and software and thus has the manufacturing of main components outsourced to producers in various Asian countries such as China, Malaysia, and the Philippines. The company through contractors maintains final assembly and distribution centers in California (US), South Korea, and China. The only company-owned facility, besides its headquarters in Cupertino, is a manufacturing facility in Ireland. Although named 'most admirable company in the United States' in 2008 by Fortune magazine, Apple gained a bad reputation for its environmental policy.

Climate Counts, an organisation that evaluates companies' performance on addressing climate change, rated them in 2008, as stuck in their efforts of investing into a more

sustainable environment. The worldwide operation NGO Green peace has constantly attacked Apple since around 2003 for not taking thorough measures towards a more sustainable business approach, especially criticizing the usage of toxic materials in the production process and the lack of recycling and waste reduction programs. The company answered these claims with publishing environmental information, achievements and goals on its company website and releasing an additional facilities report in 2008. When reviewing the apple supply chain, we see that they are in the initial phases of developing practices in the areas of our framework. In some areas, they seem to be effective, but in others, practices are new or do not exist.

Product Design

- Apple's product line is now completely free (iPod product line) or nearly free of toxic components (laptop product line).
- Apple designs its products with energy efficiency in mind, typically exceeding the ENERGY STAR requirements.
- Package design, e.g. the packaging for the fourth generation iPod Nano is 32% lighter and has 54% less volume compared to the first generation.
- Energy usage in iMacs was decreased by 93% through increased hardware efficiency from the first to the current generation.

Suppliers and Purchasing

- Apple switched to suppliers who are in compliance with the company's environmental regulations.
- Apple has a supplier code of conduct that it requires all suppliers to be in compliance with. They have specific provisions handling many aspects of environmental protection and sustainability. Environmental areas they mandate are hazardous substance management, wastewater management, air emissions management, solid waste management, and environmental permits and reporting (Apple, 2010).
- They produced a compliance report in 2010, and found three violations of hazardous waste disposal.
- Apple aligns its supply chain around these practices through routine audits, and training programs created to help suppliers comply.

Inventory Management (Manufacturing and Warehousing)

- Apple itself hardly handles inventory besides the stock at its nearly 250 retail stores and items in its facility in Ireland.

Packaging

- Apple addresses the issue of waste generated through packaging in the design phase, other than that; there is no specific information on handling packaging-related waste in other stages.

Transportation

- Apple has taken measures to reduce car usage for its US employees by establishing commuter transit programs.
- Overall though, the GHG Emissions – Employees Travel ratio increased from 2006 to 2007.

Consumption and Disposal

- Apple uses a ratio of weight recycled as percentage of past sales to formulate goals and demonstrate an increasing development of taking back sold electronics. Apple was able to achieve a 47% increase in 2007 and set its goal in achieving 50% in 2010.
- Apple claims not to ship e-waste overseas.

Assessment of Apple Computers' Profitability

A good metric to assess profitability is a company's return on equity (ROE). Apple's return on equity grew rapidly throughout the last six years, but reached a plateau in 2007 and was fairly level in 2008. It seems that the ROE on its own has too many compounding factors to provide much insight. In order to gain more insight, we utilised the DuPont Analysis that breaks down the ROE into several factors. In doing this, we see that Apple's operating efficiency and financial leverage are climbing significantly, while the asset utilisation climbed at first, but then significantly declined from 2005 through 2008. As discussed earlier, Apple had little focus on creating a green supply chain prior to 2008. This data supports that Apple has not focused on better asset utilisation as is required in a green supply chain. Apple clearly operated from 2003 until 2008 as a fast moving startup company driving their profitability through operational activities.

The effects on Apple profitability will have to be reviewed over the next few years, as sustainability activities have only begun to be adopted.

Case Study: The Coca Cola Company

Coca-Cola is a leader in supply chains and a large diverse company. As a company that is over 125 years old, it has shown longevity. Coca-Cola realised the importance of sustainability early on, but in 2002 they developed and communicated a strategy. Climate Counts rates them as striding, which means that they are making changes, but, still have some progress to make (Climate Counts, 2009). When we assess them against the framework presented in this paper they appear to be effectively transforming into a sustainable company. Since developing their sustainability strategy in 2002, they have published a sustainability report showing their progress against the metrics they defined. Moving through the supply chain, we see that they have developed strong practices in each area in order to optimize sustainability through reduction of waste and achieve improved profitability.

Product Design

- Coca-Cola has redesigned their packaging to drive efficiency and effectiveness. Much of the benefit-seen in the other areas of the supply chain is due to the redesigns they have undertaken in packaging and distribution.

Suppliers and Purchasing

- A 28% increase in supplier audits was achieved between 2006 and 2007.
- Water is their primary input to manufacturing. They measure the number of litres of water it takes to produce the same number of litres of product. They have achieved a 21% reduction in this ratio since 2002.
- Energy is another major input. A similar measurement to water is used, which is the amount of energy per litre of product. On this metric they have achieved a 19% reduction since 2002.

Inventory Management (Manufacturing and Warehousing)

- They have made heavy investment in software that optimises their planning and information flow (Computer Weekly 2004). However, their inventory turnover ratio is 4.6, which shows weakening, as it was six in 2001. This opens them up for significant waste around consumption and they need to work on improving this inventory turnover ratio.
- No matter how efficient they may be, if they are producing product they do not need or their customer does not want, this will be a greater waste than extra energy or water.

Packaging

- Coca-Cola is a leader in packaging. 98% of their product is delivered in bottles that are recyclable, or reusable.
- They are also an innovator with plastics recovery. They have developed six recycling plants around the US that have made it easier to recycle all plastics.

Transportation

- The largest hybrid truck has been developed, reducing the overall energy consumption for transporting their product by land.

Consumption and Disposal

- They are leaders in reverse logistics demonstrating upfront planning in design that allows for reuse and recycling.
- Coca-Cola has shown that a dedication to a green supply chain benefits supply chain practices as a whole. Since 2002 when they started their sustainability strategy, they have seen significant improvements in their ability to reduce consumption of water and recoverability of their packaging. Unfortunately, due to their poor record on inventory management, they are not reaping the rewards of building a strong sustainable supply chain.

Assessment of The Coca Cola Companies' Profitability

During the six years since Coca-Cola started publishing their sustainability metrics, there has been a slight, but consistent decline in their return on equity. At first glance, this would discount our premise that a green supply chain will help a business become more profitable. However, when the DuPont Analysis is done, we can break down

the components to understand what is affecting their profitability. For most of the timeframe, we see little change in operating efficiency, but more significant change in asset use and financial leverage. The primary benefit of the green supply chain is better asset use. From 2004 through 2006, there was a strong trend upward, while in both 2003 and 2007 there were significant declines. The poor asset management in 2003 was due to unexpectedly low sales, which made their inventory management appear poor because of the leftover product. In 2007, they made a series of large acquisitions, nine billion dollars in total (Coca-Cola, 2009). These both increased their financial leverage and significantly reduced their asset use efficiency resulting in poor profitability. After a year, to absorb the new actuations, in 2008 they returned to the same level of asset efficiency, but the profitability still suffered because of the higher amount of debt.

Conclusion

As the case studies show, there is still a long way to go until green methods are a part of everyday business practices for all companies. The case of Apple shows how much a well-respected and even admired company like Apple still has to improve. Through the discussion about global warming and decreasing water supply, taking proactive measures in these directions, like the Coca-Cola company has, is not only good business, but absolutely necessary.

This paper thus presents a framework that works as a guideline for which improvements at which stages can be done to become a sustainable, green supply chain. There are certainly rewards for being an environmentally responsive company. Not only should the positive effect on a company's image be taken into account, there are also potential benefits to a company's financial bottomline. The study also puts an emphasis on the fact that a green supply chain starts in the product and process design phase. It is more feasible to redesign products and processes than just invest in countermeasures to 'clean up' damage done. By rethinking the way companies produce their products from the design phase forward these issues can be prevented at the source. Yet the whole supply chain offers opportunities for more sustainable business while creating additional value. The authors chose to incorporate aspects of Lean Management into the paper because the Lean concepts already have proven to be successful when incorporated. Since Lean focuses on reducing waste, it is a good start for managers to lead their companies to a more sustainable and also profitable future.

The unique value of this study is that it creates a simple framework that easily defines what actions should and should not be taken. It also provides an integrated perspective on addressing the need for a green supply chain, aligning managers' need for profitability while responding to customers and regulators through the same best practices that companies are striving for in all supply chains.

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