



The 6th International Conference on Life Cycle Management in Gothenburg 2013

CORPORATION'S EXTERNALITIES AND LIFE CYCLE ASSESSMENT (LCA)

Birgitte Holt Andersen (CWare, Belgium), Martha Emneus (Applied Economics and Health Research (ApEHR) Copenhagen)*

**Dreve Richelle 168, B-1410 Waterloo, bgha@cware.be*

***Larsbjoernsstraede 3, DK1454 Copenhagen, Martha.emneus@appliedeconomics.dk*

Keywords: externalities; socio-economic impact; LCA; creating shared value; strategy formulation.

ABSTRACT

This paper investigates how and to which degree the concept of LCA together with sustainability frameworks can provide an additional dimension to the assessment of corporations' externalities and thereby fill the gap in classic economic theory by address broader dimensions of societal issues.

The paper assess and compare different frameworks, 'socio-economic impact assessment, triple-bottom-line', corporate social responsibility (CSR) and on this background discuss and assess the complementarity role of LCA. The paper concludes by proposing the development of a combined framework for mapping and managing externalities as basis for the formulation of a sustainable business strategy where LCA plays an important role in mapping 'hot spot' externalities, ultimately to create shared value.

CORPORATIONS AND EXTERNALITIES

Corporations produces nearly everything we consume, they generate the majority of global GNP and are the main drivers of growth, jobs and social prosperity. As such there are many good sides to corporations, but also bad ones (Sukhdew, 2011). The unaccounted costs to society of doing business are also referred to as corporations' externalities. These costs are huge- in the order of 3% of GDP every year (Trucost, 2010) and represents trillions of € worth of 'market failures'.

Corporations - large and small - therefore could play a prominent role in bringing our sourcing, our production, and our consumption into a sustainable balance. In an ideal world externalities should be internalised and reflected in financial reporting of companies. Fortunately, corporations are increasingly recognising sustainability as a market opportunity.

Mapping corporations' externalities are becoming interesting for a number of reasons. Companies want to be more responsible to secure future supply chains and sustain a 'licence to operate'. Investors seek to minimise risks and costs. Consumers want transparency and trust in the products they consume. Authorities and governments impose restrictions on activities in the local communities.

What is externalities

In general economics terms an externality is a cost or benefit that is not transmitted through prices and encountered by a third-party not involved as either a buyer or seller of the goods or services causing the cost or benefit. In this paper we will regard an externality as any impact – good or bad - not included in the corporation’s financial reporting having an impact on the society or environment in which it operates both up-stream and down-stream. That leaves us with two types of externalities; those caused by the corporations operations and those caused by others.

	Externality caused by the Corporation	External externality or societal issue
Positive	Popular workplace (Soc) Demand for local sourced organic grown cereals (Env) High tax net-contributor (Eco)	Access to high-qualified workforce (Soc) Rich on natural raw materials (Env) Low risk investment climate (Eco)
Negative	Poor working conditions (Soc) Emission of pollutants (Env) Tax avoidance (Eco)	High crime rate(Soc) Scarce clean water access (Env) Insufficient transport infrastructure (Eco)

Table 1 Types of externalities with examples, Source: Authors own

FRAMEWORKS

Impact assessment (IA) is an analysis of the consequences of an intervention whether a new policy, project or technology and can be applied both ex ante and ex post. It includes economic, social and environmental issues and is therefore in concept very similar to the idea of the triple-bottom-line. The main difference perhaps is that while the TBL is mainly associated with business, impact assessment has emerged as a tool to justify ‘public’ interventions such as new policies, programmes or (infrastructure) projects. As such impact assessment has become main-stream in public expenditure decisions over the past more than 30 years and are now a very established and well documented discipline.

Traditionally an impact assessment includes mainly the direct impacts and perhaps second-order impacts but rarely the entire ‘life-cycle-chain’. Impact assessment, also referred to as socio-economic impact assessment, is likewise closely related to Cost-benefit analysis (CBA), with the latter including cost aspects as well. IA and CBA often use a stakeholder model to identify ‘beneficiaries’. Each economic actor has a number of stakeholders or interests groups, whether it is a company, a NGO or a public entity. In the following some hypothetical examples of stakeholders and societal issues are presented.



Figure 1 The externality wheel

Life-cycle assessment (LCA) is a technique to map and assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave. Just as IAs and CBAs, LCA has over the past 30-50 years developed into a well-recognised and standardised



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approach to determine environmental impact and consequences of a given product or service. The LCA provides a snapshot of the products route from raw material to end-of-life; the focus of analysis is traditionally the physical product often measured in terms of energy consumption and CO₂ equivalence; an LCA therefore is independent of company or country boundaries. As opposed to the other frameworks mentioned in this paper, LCA is the only one not originated from the field of economics.

As a concept, the **Triple-Bottom-Line (TBL)** emerged in the nineteen-eighties, just before the concept of Sustainability was introduced in the Brundtland Report in 1987. The TBL concept suggested expanding the traditional financial accounting to embrace also the social and environmental performance of the company (Elkinton, 1997), hence the TBL was the first attempt to account for the full cost involved in doing business. TBL was adapted by a number of large corporations and government agencies in the beginning of this century, such as BP and Shell Australia alongside other similar frameworks such as ecological sustainability development or (in short) Sustainability Reporting.

Corporate social responsibility (CSR) is a form of corporate self-regulation integrated into the business operations with the basic idea that a company takes responsibility of its own social and environmental impacts. CSR originally developed from actions of purely philanthropic character in the local community (e.g. funding the local football team) into a corporate risk management tool at first focused on compliance and later moving onto the core of the corporate strategy formulation. CSR has become a mainstream business concept and grown 'big' in recent decades and most large corporations would have a dedicated CSR department feeding into corporate strategy.

Yet another approach is increasingly gaining momentum among corporate strategists. Creating **Shared Value (CSV)** (Porter, 2012) challenges the traditional business profit-maximizing approach claiming that corporate success and social welfare are interdependent and that there is a large market potential to be gained by including the societal priorities into the business objectives. Shared value is a way to create welfare innovation by creating solutions that are 'win-wins' also for the society. This is Nestle providing nutrition instead of selling food. It is NIKE offering fitness and wellness rather than selling shoes. It is Novo Nordisk addressing in a holistic way the diabetes epidemic rather than selling insulin. Hence CSV seeks to integrate societal improvements (or addressing external 'bads') into economic value creation itself. By adopting such a much broader model of economic value creation, CSV argues that many more societal needs will be met and at the same time allowing growth and innovation to prosper.

Each framework has a specific focus. LCA, in particular, is strong in mapping and measuring the externalities through-out the entire life cycle independent of company boundaries. As such life cycle analysis often reveals eye-opening results which for many products results in the majority of externalities (environmental impacts) generated during the use-phase (in the hands or mouth of the consumer) rather than during the production phase. Likewise IA and CBA are dedicated to identify the impact areas and calculate their monetary values. As opposed to LCA, however the analysis is bounded to the company or the investment project in concern. The TBL entirely focuses on the company and extend the reporting to include the social and environmental balances to complement the financial. That was new at the time, but TBL never succeeded in solving the compatibility issue among the three bottom lines. Both CSR and CSV are corporate strategic tools concerned with turning corporate externalities into business opportunities. While CSR allocate values created within the company, CSV creates economic value by creating societal value.

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	Mapping	Impact	Action
IA/CBA	√	√	÷
	Economic, social and environmental impacts of company	Willingness to pay, shadow prices, TEEB	Yes/No on investment decision
LCA	√	√	÷
	Entire Life-cycle	CO2 equivalence	Awareness raising
TBL	√	√	÷
	Economic, social and environmental impacts of company	Indicators for each bottom-line	Addresses ad hoc externalities, off-setting activities and communication
CSR	(÷)	÷	√
	Not systematically		Addresses ad hoc externalities, off-setting activities and communication
CSV	√	(√)	√
	Entire value-chain	By priority setting	Turning 'social needs' into business opportunities

Table 2 Overview of frameworks

CONCLUSIONS

Ideally, we strive to pick and choose the best of each of the frameworks to develop a combined framework allowing us to map, analyse and manage externalities.

LCA is unique in providing for a mapping of externalities throughout the value chain focusing on what it takes to make, use and get rid of an actual product – independent of company boundaries. The IA and CBA we can apply at company level – the economic actor and the stakeholders to be affected by any externalities imposed by the company or among whom a societal issue might represent a corporate opportunity.

Running the externality wheel through-out the life cycle or the value chain, allow us to identify the externality-hot-spots of the entire value chain, both those imposed by the company but also an identification of societal issues along the way. With CSR and in particular CSV we can formulate appropriate actions to address the identified 'externality-hot-spots' through-out the value chain.

Economic theory is impersonal, non-spatial and fails in describing the narratives. By combining the frameworks in a united analysis we get a very powerful tool allowing us to capture the narratives, understanding the course of the externalities and identify hot spots.

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