CFIA & EADI Workshop 2015: When Can Frugal Innovations Become Inclusive Innovations?

Does frugal innovation enable sustainable development? A systematic literature review

Eugenia Rosca, PhD Student
Jacobs University Bremen
The Hague, Netherlands,
November 26, 2015

Production & Logistics Networks Workgroup

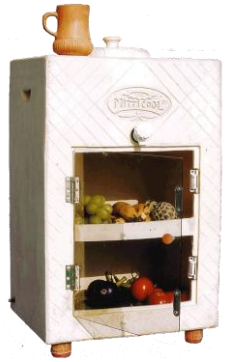
JACOBS UNIVERSITY

Motivation

1. Increasing societal pressure for companies to adopt triple bottom line approaches (Porter and Kramer, 2011; Ahlstrom, 2010)
2. Business as part of the solution to global challenges and active contributors to sustainable societal development (Bruton, 2010)
3. Developing markets at the Base of the Pyramid (BOP) should be part of companies‘ sustainability agenda
4. Frugal innovation as a way of creating economic value and alleviating poverty at the BOP

Tata Nano, TATA Motors

Electro Cardiogram (ECG, GE)



Non-Electric Fridge, Mitti Cool

What is Frugal Innovation?

- Numerous terms used interchangeably in the literature (Zeschky et al. 2014; Soni and Krishnan, 2014; Brem and Wolfram, 2014)

Towards an understanding of frugal innovation

Aspects	Selected understanding
Direction of innovation	▪ Developed either in industrialized or developing countries, but commercialized in developing countries
Product, process or business model orientation	▪ It may involve entirely new product architectures or technologies (Zeschky et al., 2014), but also re-designed existing ones. ▪ It may use existing or establish new processes, business models and value propositions through business model innovation (Prahalad and Mashelkar, 2010)
Innovation initiators	▪ Large global companies, local small and medium sized enterprises or local entrepreneurs
Target Markets	▪ Both BOP and middle class customers
Outcomes	▪ (Depending on initiator) Primary motivation to develop BOP and middle class consumer bases in developing markets

Sustainable Development through Frugal Innovation?

Production & Logistics Networks Workgroup

JACOBS UNIVERSITY

Sustainable Development

- Sustainability
- Triple Bottom Line Approaches
- Inclusive Growth
- Economic, Social and Ecological Considerations

Frugal Innovation

- Poverty alleviation through economic activity premise (Bhatti, 2012)
- Ecological considerations through low use of resources during product development and lifecycle stages (Sharma and Iyer, 2012)
- Sustainable development not inherent to frugal innovation (Rosca, Bendul and Arnold, 2016)
- Business model architecture as enabler of sustainable value creation (Rosca, Bendul and Arnold, 2016)

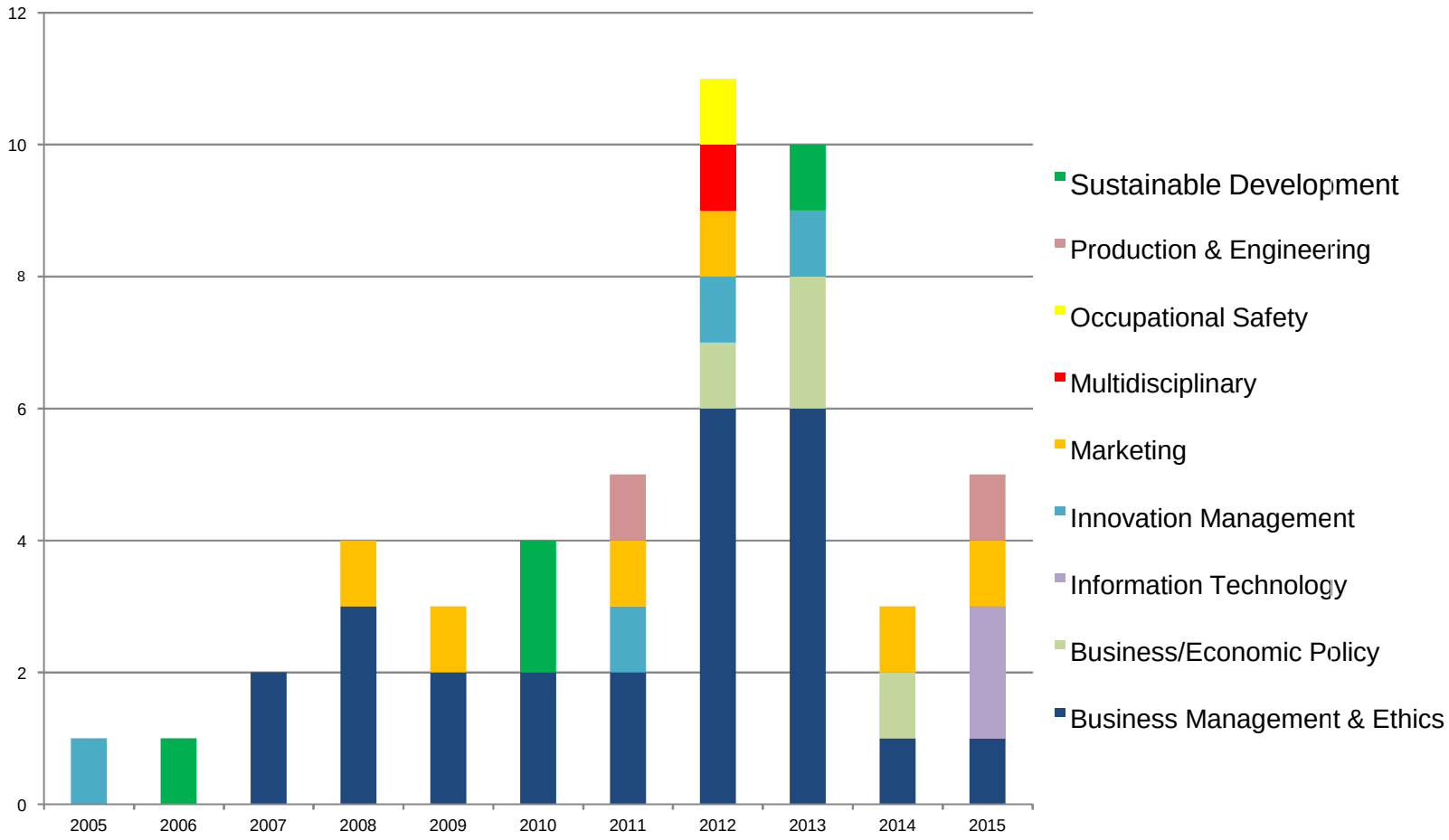
Research Gap: Weak connection between frugal innovation and sustainable development (Kolk et al. 2013; Gold et al. 2013)

Research Aim: Perform a systematic literature review and evaluate existing articles on potential positive and negative outcomes of frugal innovations.

Methodology

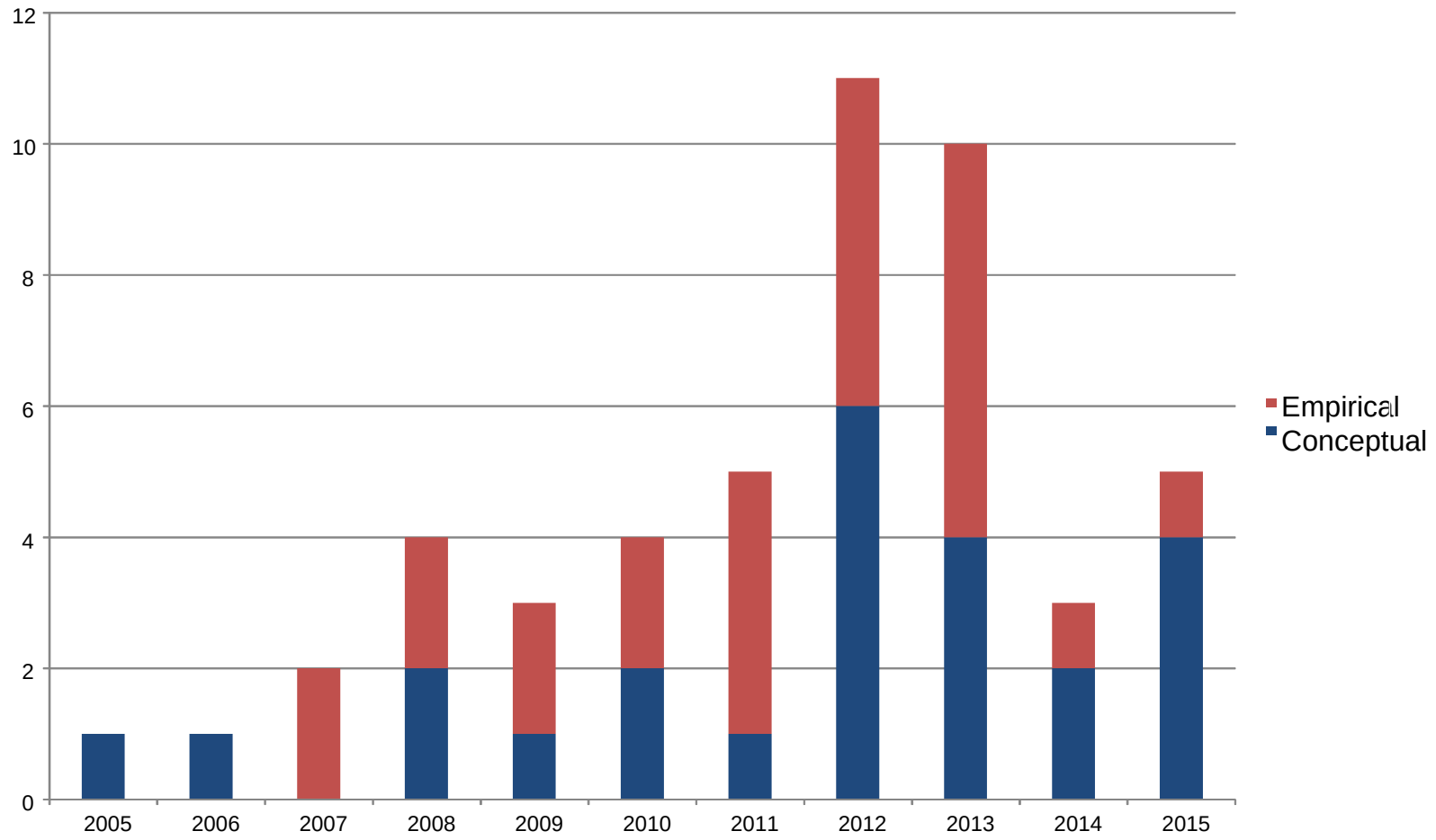
	Stage 1 - Paper Searching	Stage 2 - First Screening Stage	Stage 3 - Coding
Process	1. Time frame: 2000 to October 2015 2. Key-words: frugal innovation and sustainability 3. Databases: ProQuest and EBSCO	1. Remove book reviews, periodicals and duplicates 2. Read abstracts	1. Read articles full text 2. Remove irrelevant articles 3. Evaluate using the developed coding scheme with 23 categories of data
Outcome	▪ Numer of papers per keyword/combination of keywords per database	▪ 84 peer-reviewed, academic journal articles	▪ 49 articles found to be relevant ▪ Coded articles

Findings - Sustainability Focus and Disciplines



Frugal innovation's effect on sustainability appears to have peaked in 2012 after large growth from 2005. Most of the growth in academic literature has occurred in journals within the discipline of business management & ethics.

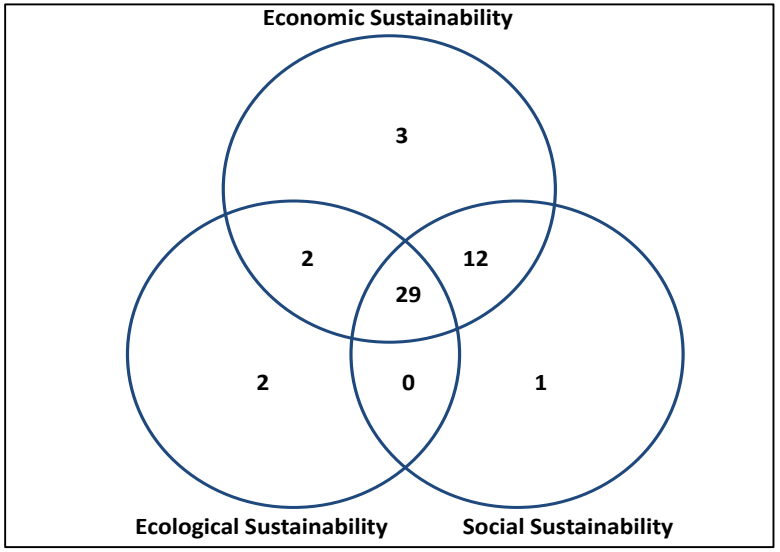
Findings - Conceptual vs Empirical



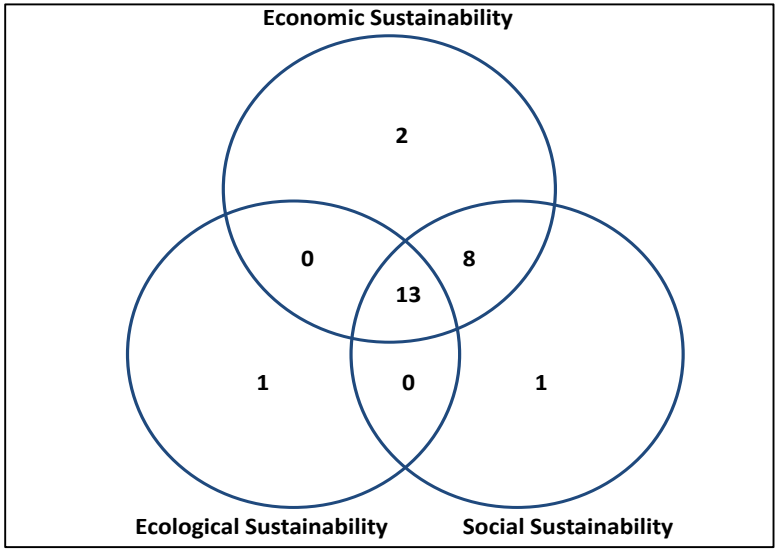
The analyzed empirical works contain a total of 35 unique case studies on the sustainability outcomes created by 33 unique organizations' frugal innovations.

Findings - Sustainability Dimension and Impact

Count of total papers by type of sustainability addressed.



Count of empirical papers by type of sustainability addressed.



Outcomes of Frugal Innovation on the different types of sustainability

Type of Outcome	Economic	Ecological	Social
Positive Outcome	71.74%	50.00%	70.45%
Neutral Outcome	13.04%	14.29%	13.64%
Negative Outcome	15.22%	35.71%	15.91%

Findings highlights a focus of authors on economic and social sustainability, and a potential neglect of ecological consequences of frugal innovation.

Findings – Economic Dimension

Issues	Highlights
Indicators	▪ Internal firm performance: profit, economic value added, return on investment. ▪ External stakeholder economic value creation: employment, infrastructure, rising income and micro-financing.
Strategies	▪ Frugal product design, local sourcing and manufacturing and basic functionalities ▪ Social franchising and franchising as models of growth (Kistruck et al. 2011; Alur and Schoormans, 2011)
Challenges	▪ Low margins, high volumes and scalability needed ▪ Internal firm resistance (Olsen and Boxenbaum, 2009)

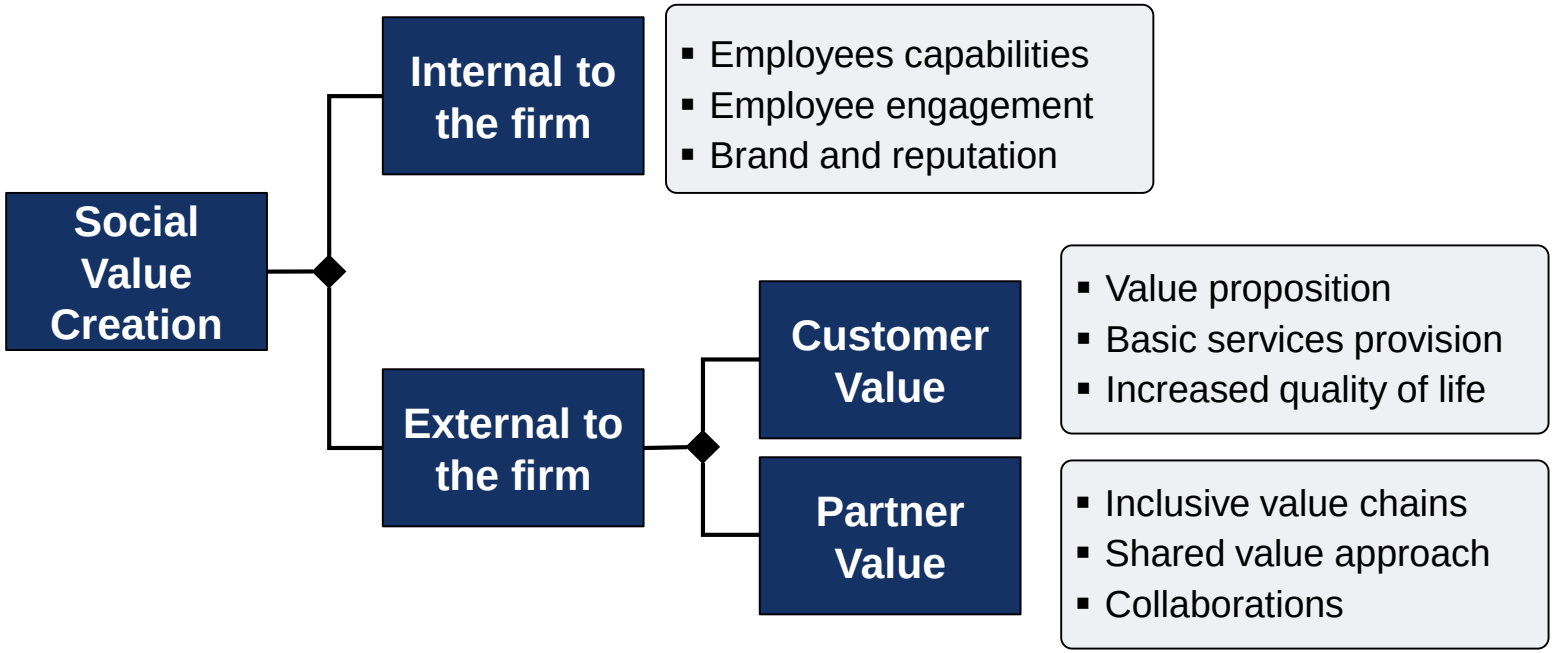
94% pf articles coded analyze economic sustainability which is a pre-requisite for sustainable social and ecological value. However, focusing solely on economic performance without social or ecological considerations may lead to destructive outcomes.

Findings - Ecological Dimension

General findings	**Strong conceptual base, but weak empirical evidence.**
Focus	**Renewable energy and clean technologies**
Positive externalities	**Frugal product and process design enhances green products and supply chains.**
What about the negative externalities?	**Increased consumption and waste, environment exploitation, GHG emissions and deforestation.**

The ecological dimension is largely neglected in empirical studies. Yet, incorporation of ecological aspects into the frugal/BOP discourse is crucial, because eradicating poverty from developing countries can create significant ecological damage (Hart, 2005).

Findings – Social Dimension



Classification based on Venn and Berg (2013)

The social dimension is widely investigated including a multitude of indicators which report both positive and negative effects.

Findings – Contribution to Poverty Alleviation

Monetary Approach
- Income, debt levels, employment, infrastructure

Capabilities Approach
- Capabilities empowerment through provision of basic products and services and opportunities

Social Exclusion Approach
- Self-esteem, dignity, access to knowledge networks

- Social indicators used in frugal and BOP studies should be multi-dimensional similar to poverty.

Arnold and Valentin (2013), Shivarajan and Srinivasan (2013)

Findings – Frugal Innovation Possible Outcomes on Sustainability

Production & Logistics Networks Workgroup

JACOBS UNIVERSITY

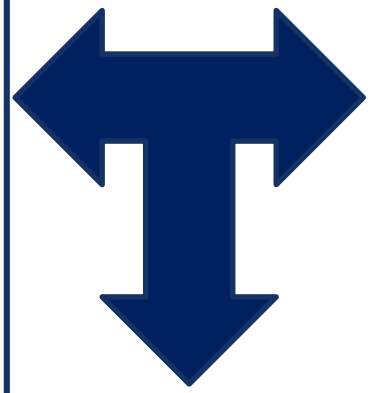
Social Outcomes

External to the firm

- Meet underserved basic needs of poor
- Social inclusion and stakeholder engagement
- Capabilities and human capital development through education and training
- Access to information and knowledge networks
- Social equality, development and democratization
- Access to energy, clean and safe water, nutrition, sanitation, healthcare, financial and technical resources
- Human rights protection
- Safety of working conditions
- Increased standard of living and decreased morbidity levels

Internal to the firm

- Managerial capabilities
- Reputation
- Employee engagement
- Partnership capabilities



Ecological Outcomes

Positive

- Clean technologies for energy and water
- Renewable energy use (solar, wind, biogas)
- Pollution prevention
- Product stewardship
- Low ownership costs of products (lifecycle costs)
- High resource productivity
- Reduced complexity and input of value chain activities
- Environmental friendly materials and biodegradable packaging

Negative

- Local environment degradation
- Environmental damage due to increased consumption
- Deforestation
- GHG emissions from construction activities
- Increasing quanities of waste

Economic Outcomes

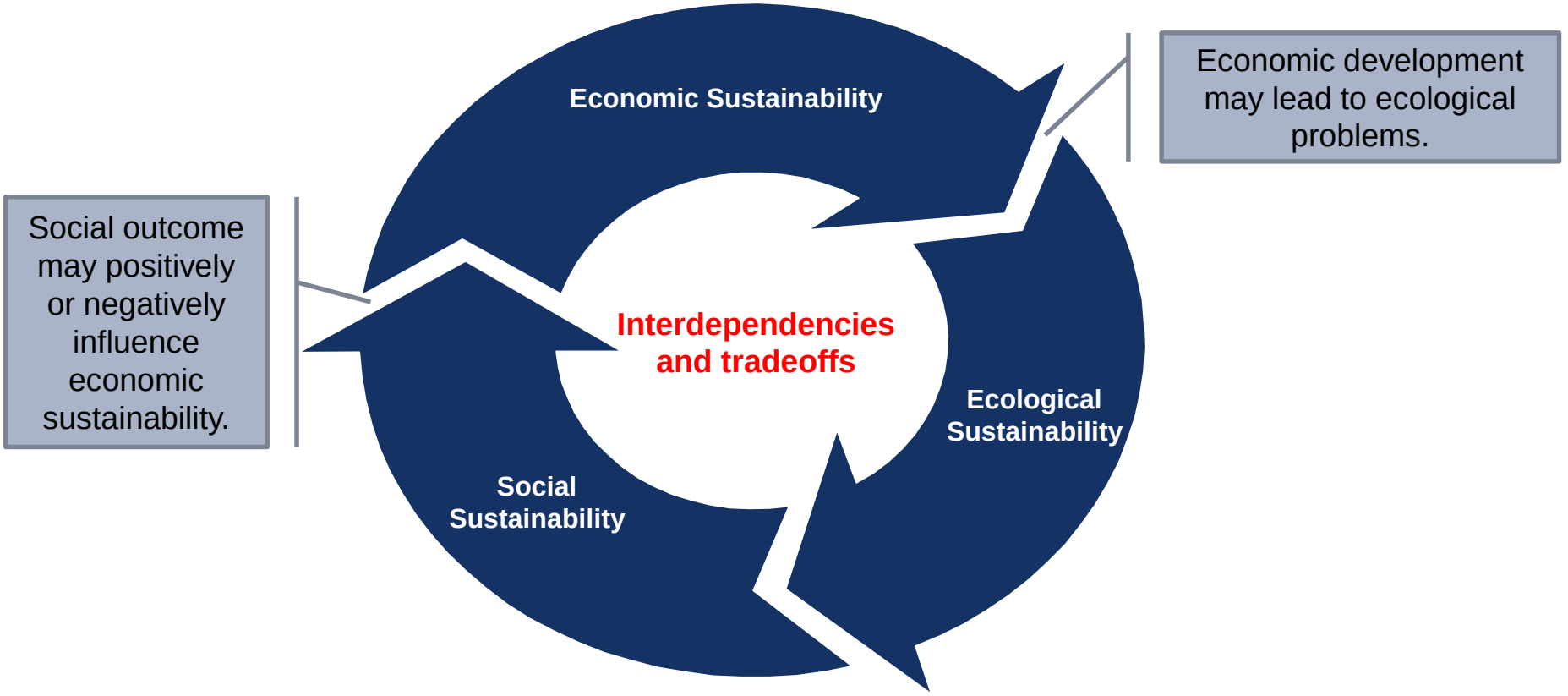
Internal to the firm

- Profit, Economic value added, Return on Investment
- Scalability, high volume, low margins, growth and revenue
- Global economies of scale
- Competitive advantage

External stakeholders

- Local employment opportunities/Access to employment markets
- Stable and rising income, economic empowerment
- Infrastructure and local economic development
- Access to capital and micro-financing options
- Creation and diversification of local economic and entrepreneurial opportunities
- Increased productivity levels through education and training

Findings - Integrated Sustainability Perspective



The tradeoffs between the three sustainability dimensions need to be better understood and analyzed. The understanding will enable the development of integrated solutions which create sustainability rather than reduce unsustainability (Ehrenfeld, 2005).

Implications for Theory and Practice

Theoretical Implications

Managerial Implications

Contributions and Implications

- Framework developed serves as basis for indicators to be used in further empirical studies
- Extends the framework of London (2009)
- Need for empirical, quantitative, longitudinal studies to investigate the interdependencies and tradeoffs between economic, social and ecological sustainability

- Sustainable products, processes and business models which create sustainability rather than reduce unsustainability
- Traditional economic performance indicators combined with social, ecological indicators from a stakeholder view

Limitations and Future Research

Limitations

Future research

Highlights

- Methodology: the searching procedure based on keywords and databases
- Methodology: coding performed by 2 authors

- Refine searching method and improve the list of keywords in order to account for a holistic view on sustainability
- Two more coders and ensure consistency of coding (inter-rate reliability index)

Jack Reedy
j.reedy@jacobs-university.de
Jacobs University
Bremen, Germany

Eugenia Rosca, MSc
e.rosca@jacobs-university.de
Jacobs University
Bremen, Germany

Julia Bendul
j.bendul@jacobs-university.de
Jacobs University
Bremen, Germany

JACOBS
UNIVERSITY