Automotive Industry Research Report

Benchmarking Corporate Responsibility Practices

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1. Introduction

Recent industry trends often said to have been spurred to a faster pace by the Brundtland Report, are challenging complex manufacturing organizations to ensure that they are profitable along with demonstrating high levels of corporate responsibility. Indeed, most firms recognize today that their operations and supply chain must function in ways "that meets the needs of the present without compromising the ability of future generations to meet their own needs.[1]" Towards that end, most firms have started endeavors that enable them to manage and improve their organization's corporate responsibility/sustainability profile. As organizations endeavor to implement practices that ensure sustainable operations, and strive to develop a supply chain that demonstrates high levels of corporate responsibility, they are faced with multiple practices from which to choose. Typically. simultaneous efforts along multiple dimensions are warranted, with returns to such investments often being unclear.

Over the last decade, a number of corporate responsibility practices have gained popularity, for example, those related to managing environmental pollution, chemical compliance, resource conservation, and ensuring that the operations are socially responsible. In addition, as organizations provide more complex products and deal with intertwined and intricate supply chains, practices to ensuring that the supply chain behaves in ways that exemplify corporate responsibility are becoming prominent. In the pursuit of developing sustainable operations and supply chain, those which demonstrate high levels of corporate responsibility, it is critical to understand the current state of industry-wide corporate responsibility practices. The hot-button nature of this topic, along with the increasing recognition that being socially responsible as an organization is the way of the future, presents an opportunity to assess the state of the industry and evaluate whether it is possible to do well (financially) while doing good.

With this in mind, this research aimed at (a) benchmarking industry practices for corporate responsibility, (b) benchmarking the potential tangible and non-tangible benefits from having responsible operations and supply chain and (c) evaluating whether there is a link between higher levels of sustainable operations and performance of firms. With the objective of obtaining quantifiable empirical evidence, this research was conducted by relying on a large scale survey of firms in the manufacturing industry. The remainder of this executive summary is organized as follows. Section 2 provides an executive summary of the key findings. Section 3 offers an overview of the sample[2]. Section 4 presents the segmentation of the sample and the firm performance profiles. Section 5 discusses the aggregate corporate responsibility profiles of the segmented sample. Section 6 then delves into the details of the practices investigated in this project. Finally, the report closes with a conclusion in section 7, and section 8 presents key acknowledgments.

[1] Text in quotes is from WCED (1987) 'Our Common Future'

[2] Note that all data are reported in aggregate format, individual respondents/firms cannot be identified

2. Executive summary

Professionals from a total of 143 firms returned complete and usable responses. These responses form the sample (see section 3 for sample details) used to develop the reported insights. In conducting the analysis three firm segments were identified based on the firm's performance along dimensions reflecting both business and corporate responsibility performance (see section 4 for details of segmentation). These groups were labeled as *leaders*, *followers,* and *laggards* based on the overall firm performance. Following are the key insights which emerge

- Firms that fall into the leader segment based on business and corporate responsibility also consistently demonstrate higher levels of investments, capability, and implementation of corporate responsibility practices. In contrast, laggard segment firms show lower performance and consistently lower levels of corporate responsibility. This indicates that corporate responsibility is associated with better overall firm performance.

- Product stewardship (i.e. developing products while minimizing their impact on the environment) is the most adopted practice across all three groups.
    - Firms in the leader segment also use tools such as cradle-to-cradle design, design for disassembly, and design for environment to a significantly larger extent compared to the follower and laggard firm segments.

- Linking financial and non-financial incentives to corporate responsibility is critical.
    - Firms in the leader and follower segments report offering significantly more incentives, as compared to the laggard segment firms which have a very low level of incentives linked to corporate responsibility.
    - Firms also follow a top-down approach for linking incentives to corporate responsibility, with higher levels of incentives reported linked for chief officer, VP and Director levels by leader segment firms.
    - All firm segments have lower incentives linked at mid to lower management and individual employee levels.

- Leader segment firms report consistently higher levels of overall investments across categories of chemical management, resource conservation, verification of corporate responsibility in the supply chain, traceability, and human rights issues.
    - The most prominent area where all firm segments report highest investment levels is chemical management. This is followed by a focus on recycling materials, and verification and traceability of environmental impact.

- Overall the sample firms report a moderate level of integration of corporate responsibility in supply chain design decisions. This represents an area requiring more effort for incorporating sustainability in decisions relating to the supply chain.
    - Leader segment firms report moderate-high levels of integration. Incorporating corporate responsibility in manufacturing network design is reported to have the higher priority, followed by supply base design, and then logistics network design.

- Overall leader segment firms report higher levels of collaboration for corporate responsibility internally (i.e. cross-functional) as well as with suppliers and customers, as compared to the follower and laggard segment firms. Indicating that a collaborative approach to integrating corporate responsibility within the organization and supply chain is important.
    - Leader firms report the highest collaboration cross-functionally, followed by supplier, and then customer collaboration. In contrast, laggard firms report the highest collaboration with customers, then suppliers and finally cross-functional. This indicating that the two firm segments take contrasting approaches (inside-out vs. outside-in).
    - The area reported with highest collaborative initiatives by leader segment firms (in order) are: chemical management, resource conservation (i.e. recycling, energy conservation), environmental efforts, verification and traceability for environmental issues, followed by human/social issues (including verification/traceability)

- Leader segment firms report significantly higher levels of supply base capability, followed by the follower and laggard firm segments.
    - Approximately 17 percent (leader segment – 11%, follower segment 5% and laggard segment 2%) of all respondents report that 80% or more of their supply base has ISO 14000 certification.
    - Leader firms also report that significant portions of their tier-one suppliers do conduct second-tier supplier audits for environmental and human rights issues.
    - Leader segment firms report using evaluation for corporate responsibility (including environmental and social/human rights issues) for a significantly higher proportion of their suppliers as compared to laggard firms.
    - Leader segment firms also report higher levels of site visits to suppliers for corporate responsibility compared to laggard firms.
    - Training and education are the most frequently utilized tools for supplier development for corporate responsibility

3. Sample description

Over the course of this survey project, 143 complete and usable responses from firms in manufacturing industries that directly (e.g. Tier 1) or indirectly (e.g. Tier 2, etc.) supply to the automotive original equipment manufacturers were obtained. Industries were identified at a two-digit SIC level and the breakup of respondents is shown in Table 1. Also shown below in Table 2, is the summary of respondent titles. Respondents were from the executive and upper management level, with about 27.27% of the respondent titles at the chief executive officer level (CEO, Chief Sustainability/Corporate responsibility officer, Chief Operations Officer, Chief Supply Chain Officer), 26.57% of the respondents had VP level titles and the rest (46.15%) were at the director level. This provides a formidable response dataset within which the strategic nature of corporate responsibility practices can be investigated. Further, the survey also included a screener question that required respondents to rate their knowledge on their firm's corporate responsibility practices on a five-point Likert scale (not familiar, below average familiarity, average familiarity, above average familiarity and very knowledgeable), and only respondents who indicated that they had above average familiarity or were very knowledgeable were included in the survey. Respondents were also characterized by a significant length of work experience, both within their current firm (median tenure in the firm: 8.5 years; average: 11 years; maximum: 45 years) and within the field overall (median tenure in the field: 15 years; average: 18 years; maximum: 54 years).

Table 1. Industry Distribution

Standard Industry Classification (Two digit)	Frequency	Percent
Major Group 25: Furniture & Fixtures	14	9.79%
Major Group 28: Chemicals & Allied Products	27	18.88%
Major Group 30: Rubber & Miscellaneous Plastics Products	16	11.19%
Major Group 31: Leather & Leather Products	2	1.40%
Major Group 32: Stone, Clay, Glass, & Concrete Products	9	6.29%
Major Group 33: Primary Metal Industries	10	6.99%
Major Group 34: Fabricated Metal Products, Except Machinery & Transportation Equipment	18	12.59%
Major Group 35: Industrial And Commercial Machinery & Computer Equipment	14	9.79%
Major Group 36: Electronic & Other Electrical Equipment & Components, Except Computer Equipment	25	17.48%
Major Group 37: Transportation Equipment	8	5.59%
Total	143	100.00%

Table 2. Respondent Titles

Respondent Titles	Frequency	Percent
Chief Executive Officer	21	14.69%
Chief Sustainability/Corporate Responsibility Officer	7	4.90%
Chief Operations Officer	6	4.20%
Chief Supply Chain Officer	5	3.50%
VP Sustainainability/Corporate Responsibility	7	4.90%
VP Operations	22	15.38%
VP Supply Chain	9	6.29%
Director of Sustainability/Corporate Responsibility	10	6.99%
Director of Operations	40	27.97%
Director of Supply Chain	16	11.19%
Total	143	100.00%

Table 3 presents a brief summary of the firm's represented in this sample. More than half the firms (54.55%) in the sample had been in business for over 20 years. Firms were evenly distributed based on their annual sales. Specifically, 29.37% of responding firms had sales of less than $50 million, 30.77% had sales between $50.1 and $300 million, 18.18% had sales between $300.1 and $1 billion, and 21.68% had sales of over $1 billion. In addition, a significant number of firms did not have any unionization (44.76%); while only 10.49% of the firms had most of their labor force (i.e. greater than 75% of workforce) represented by unions.

Table 3. Summary of Firm Characteristics

Firm Age	Freq.	%	Annual Revenue	Freq.	%	Percent of unionization	Freq.	%
less than 5 years	7	4.90%	Less than $50 million	42	29.37%	none	64	44.76%
5-10 years	15	10.49%	$50.1 to $300 million	44	30.77%	less than 25%	17	11.89%
11-15 years	19	13.29%	$ 300.1 to $1 billion	26	18.18%	26-50%	26	18.18%
16-20 years	24	16.78%	$1 billion to $5 billion	20	13.99%	51-75%	21	14.69%
more than 20 years	78	54.55%	Over $5 billion	11	7.69%	greater than 75%	15	10.49%
	143	100%		143	100%	Total	143	100%

4. Firm performance profiles

Our focus in the present research project was the investigation of corporate responsibility practices and identify the current state-of-the-art. This research also aimed to understand the tangible (financial performance) and intangible (brand performance and stakeholder satisfaction) that can result from adoption of state of corporate responsibility practices. In order to understand the firm's adoption of corporate responsibility practices and the potential performance consequences, this research profiled the firms in the sample into three groups. These three groups were developed by considering both corporate responsibility as well as business performance of firms.

The survey measured two dimensions of corporate responsibility performance:

- Regulatory compliance: refers to the performance on firms in terms of meeting local, regional and national level regulations.

- Environmental performance: refers to the performance of the organization in terms of environmental criteria. Environmental performance is reflected in the organizations' performance on metrics related to ***reduce*** (energy consumption, water usage, emissions, pollution, and hazardous waste), ***recycle & reuse*** (waste material, packaging, and products).

In addition, the following three dimensions of traditional business performance were measured:

- Financial performance: refers to the performance of the firm in terms of financial measures, including return on assets, return on sales, profit margin, return on investments, and net income.

- Brand performance: refers to the firm's brands and market performance in terms of market share, brand awareness, brand quality and brand equity.

- Stakeholder satisfaction: refers to the performance of the firm in terms of satisfaction of various constituents including, shareholders, employees, local community, key suppliers, and customers, etc.

In managing firm performance, it is critical that firms ensure that they not only excel in terms of business outcomes but also demonstrate superior corporate responsibility. Therefore, in profiling firms this research used an equally weighted average on the five dimensions of performance mentioned above was developed. Firms that were in the best 25th percentile on overall performance were labeled as the *leaders*; these were firms that experienced, on average, top performance in their industry across the five individual performance dimensions noted above. In contrast, the last 25th percentile formed our group

of *laggards*, who experienced, on average, the bottom of the industry performance. The group in between represents the category which was label the *followers*.

Table 4 provides the average ratings for each of the three groups across the performance dimensions. Questions assessing performance referred to individual performance measures and how respondents placed their firm's performance compared to their industry on a five-point Likert scale (1 – bottom 20 % of industry, 2 – 21 % to 40% of industry, 3 – 41 % to 60 % of industry, 4 – 61 % to 80% of industry, 5 – top 20 % of industry)

Table 4. Classification of firms

Performance dimension	Leaders	Followers	Laggards
Regulatory compliance	4.69	3.48	2.52
Environmental perf.	4.24	3.43	2.43
Financial perf.	4.49	3.52	2.50
Stakeholder satisfaction	4.53	3.60	2.62
Brand perf.	4.55	3.70	2.40

This information is also presented graphically in Figure 1, in the form of a spider-graph mapping the relative performance of the *leaders, followers, and laggards*. For each of the five dimensions, the average of the individual items comprising the dimension was taken first and then an overall performance is an average across all five dimensions. The chart illustrates the consistently better performance of the leaders across all performance dimensions. This suggests that these leading firms are able to clearly excel simultaneously at both business and corporate responsibility performance. Followers seem to have lower performance and the laggards represent firms that are struggling in terms of both corporate responsibility as well as business performance.

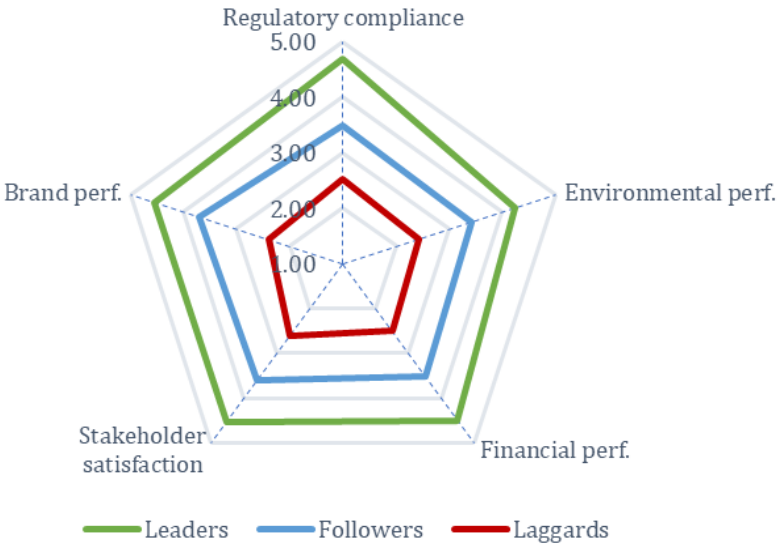

Figure 1. Performance profiles

5. Aggregate corporate responsibility profiles

A key focus in the present research project was the identification of corporate responsibility practices and resource profiles to provide a benchmark of the current state-of-the-art. In the process of doing so, it was also important to evaluate and identify the practices, capabilities and resource profiles of firms identified as leaders, and compare these to the follower and laggard groups. This research collected information on six categories of practices that reflect both intra- and inter-organizational aspects of operations and supply chains with high levels of corporate responsibility. This section provides the aggregate view of differences between the three identified firm groups. Details of how practices within each of the categories differ across leaders, followers, and laggards are presented in subsequent sections.

The following aggregate practices and capabilities related to corporate responsibility were identified and benchmarked in the survey:

- Investments for Corporate Responsibility: refers to the investments in terms of money, time and effort, that firms have dedicated towards various CR practices (e.g. greenhouse gas reporting, pollution prevention, verification and traceability in the supply chain, social issues, etc.). Rated on a five-point Likert scale from 1 – no investments to 5 – extensive investments.

- Incentives for Corporate Responsibility: refers to the use of financial (e.g. bonus, etc.) and non-financial (awards, etc.) performance-based incentives linked to corporate responsibility at various levels (C-suite to employees) of the organization's hierarchy. Rated on a five-point Likert scale from 1 – no incentives to 5 – extensive incentives.

- Sustainable Supply Chain Design: refers to the priority placed on considerations related to the environment in the firm's decisions for designing their (a) supply base, (b) manufacturing, (c) logistics networks, and (d) reverse logistics networks. Rated on a five-point Likert scale from 1 – very low priority to 5 – very high priority.

- Product Stewardship: refers to the integration of environmental considerations in the firm's product design. Rated on a five-point Likert scale from 1 – strongly disagree to 5 – strongly agree for statements representing their firm's approach to sustainable new product design.

- Sustainable Supply Chain Collaboration: refers to the extent of which a firm engages in collaboration (a) within the firm across functions, (b) with its suppliers, and (c) with its customers, on various aspects of corporate responsibility (e.g. greenhouse gas reporting, pollution prevention, verification and traceability in the supply chain, social issues, etc.). Rated on a

five-point Likert scale from 1 – very low collaboration to 5 – very high collaboration.

- Supplier Environmental Capability: refers to the proportion of the firm's supply base that demonstrates a high level of environmental achievement as reflected in environmental certification, ability to show verification, and implementation of supplier environmental management practices (e.g. selection, and auditing of tier-two suppliers.). Rated on a five-point Likert scale from 1 – less than 20% of suppliers to 5 – more than 80% of suppliers.

Table 5. Average ratings on corporate responsibility practices

Corporate Responsibility (CR) Practices	Leaders	Followers	Laggards
Investments in CR	3.26	3.02	2.69
Financial incentives for CR	3.28	2.95	2.55
Non-Financial incentives for CR	3.09	2.96	2.46
Sustainable supply chain design	3.41	3.12	2.78
Product stewardship	4.13	3.72	3.67
Sustainable supply chain collaboration	3.44	3.05	2.45
Supplier environmental capabilities	3.39	2.79	2.39

Table 5 shows the average ratings for firms in the three groups. It is interesting to note that most firms indicate a moderate to high level of implementation for product stewardship indicating that firms are integrating new product development concerns in their product development processes. While leader firms have adopted most practices at a moderate to high level (scale points 3 and 4) on most practices, very few if any firms have gone to extensive levels. In contrast, laggard firms are making a very low level of progress for corporate responsibility. Interestingly though, even within this group, the mean ratings are between 2 and 3 indicating that even laggard firms have started to realize the importance of sustainability and have started moving towards investing efforts for corporate responsibility.

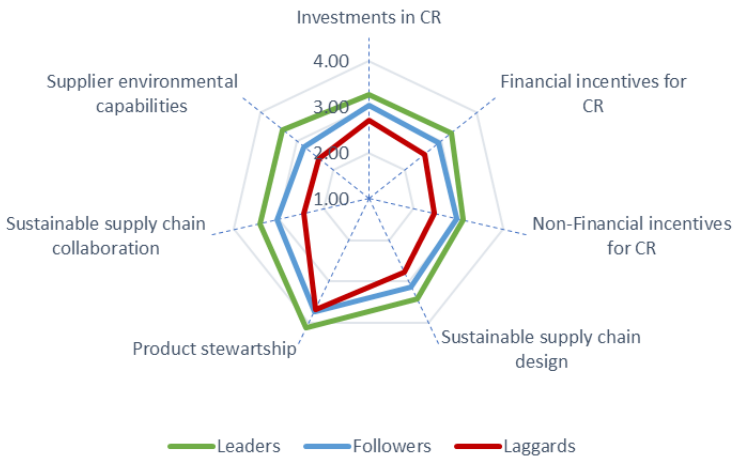

Figure 2. Corporate responsibility profiles

Figure 2 shows a spider graph highlighting the distinction across the three groups of firms in terms of overall approach to corporate responsibility. It is clear that leading firms (i.e. those that have highest aggregate performance) have more developed and advanced implementation of all corporate responsibility practices. The above figure also demonstrates some interesting patterns. For example: Developing environmentally friendly products (a.k.a. product stewardship) is the primary and most adopted approach towards corporate responsibility, leading firms clearly are making extensive strides for product stewardship. While product stewardship is clearly the most adopted practice, follower and laggard firms, do not show as much distinction in this regard. However, in looking at aspects of investments in CR, providing financial and non-financial incentives, and integrating sustainability considerations in supply chain design, leader and follower firms are closer in their approach as compared to laggard firms. The areas which show the highest distinction across the three groups include, initiating collaboration for corporate responsibility and having an environmentally capable supply base. The three groups seem to differ most in their approach for these dimensions.

6. Detailed corporate responsibility profiles

This section describes the results of the individual corporate responsibility practices. Statistics are typically reported based on the overall sample, and again, then split up by performance category (leaders, followers, laggards). The section also highlights the important key elements for each type of practices.

6.1 Investments in corporate responsibility

With increasing recognition of the importance of corporate responsibility, organizations are starting to dedicate resources in the form of time, money and efforts towards various aspects of corporate responsibility. This research evaluates the extent to which organizations have made investments towards aspects of environment, resource use, chemical management, human/social issues, traceability in the supply chain and verification in the supply chain. Respondents were asked to rate their firm's efforts on various aspects of CR on a five-point Likert scale (1-no investments, 2 – low investments, 3 – moderate investments, 4 – high investments, 5- extensive investments). The results for the overall sample are presented in Table 6.

Table 6. Investments in corporate responsibility

Investments in Corporate Responsibility	Overall Sample	
	Average	St.Dev.
Environmental		
Greenhouse Gas Reporting	2.69	1.34
Pollution Prevention	3.00	1.26
Resource Use		
Natural resource use	2.88	1.31
Increasing recycling of materials	3.31	1.12
Chemical Management		
Managing chemical compliance	3.39	1.17
Managing chemical disposal	3.49	1.22
Human/Social Issues		
Conflict minerals reporting	3.03	1.39
Forced/bonded labor issues in the supply chain	2.64	1.31
Traceability in the supply chain		
Traceability of environmental impact in the supply chai	3.03	1.27
Traceability of human rights issues in the supply chain	2.68	1.31
Verification in the supply chain		
Verification of environmental claims in the supply chai	3.03	1.26
Verification for fair human treatment in the supply chai	2.85	1.38

As noted in the table above, chemical management stands out as the key area where firms have made moderate to high investments. This is followed by aspects related to resource use and the environment. It is also important to note that on average, verification activities and traceability, especially those related to the environment, are areas with moderate investments. Finally, this is followed by investment in conflict minerals and labor issues.

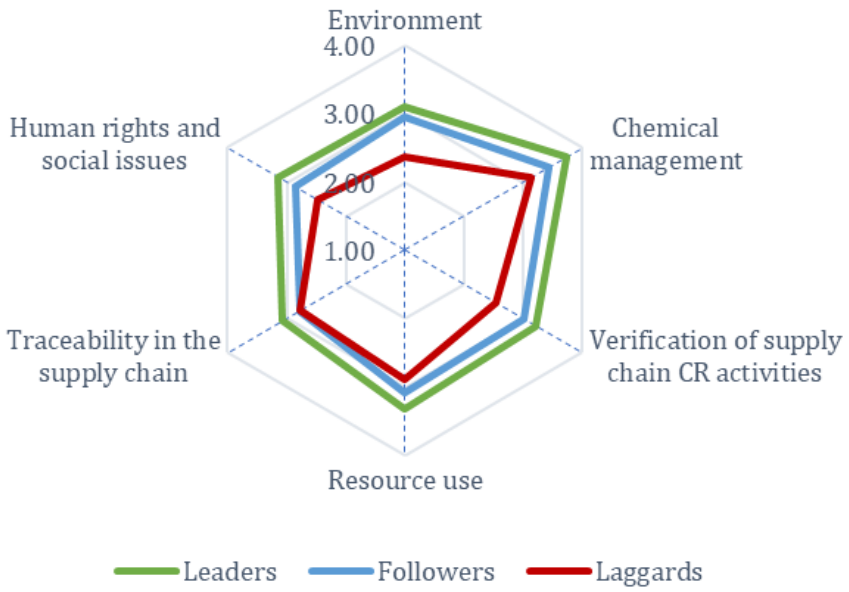

Figure 3. Investments in corporate responsibility

Figure 3 provides an interesting summary of investments in corporate responsibility activities for the three performance groups. The figure reports investments aggregated by dimensions of environment, chemical management, human rights, traceability and verification of the supply chain. It is then broken up by firm categories of leaders, followers, and laggards. As such, leaders seem to differentiate themselves by having larger levels of investments in corporate responsibility. Interestingly, a clear area of distinction between leader/followers and laggards is the area of verification of supply chain CR activities. Here, leaders and follower firms seem to have made more investments. Along similar lines, two other areas emerge as prominent. These are environmental activities and human rights issues. Clear delineation exists between leading firms and laggard firms in these areas as well. Aspects of chemical management seem to also receive the most priority within each group. The least separation between three groups in terms of investment is in areas of traceability in the supply chain and resource use. Indeed, traceability in the supply chain can help minimize risks and increase the efficiency of resources while aligning business and environmental objectives to represent win-win situations. This plausibly can be a reason why the three firms are all close in terms of their focus on these areas.

6.2 Incentivizing corporate responsibility within the organization

It is well known that incentives play an important role in motivating managerial behavior. Indeed, organizations can use appropriately designed financial and non-financial incentives to align decision making at all levels of the firm to the overall goals of the organization. This research asked respondents questions on the level of incentives that were offered across the organizational hierarchy using a five-point scale (1-no incentives, 2 – low incentives, 3 – moderate incentives, 4 – high incentives, and 5 – extensive incentives).

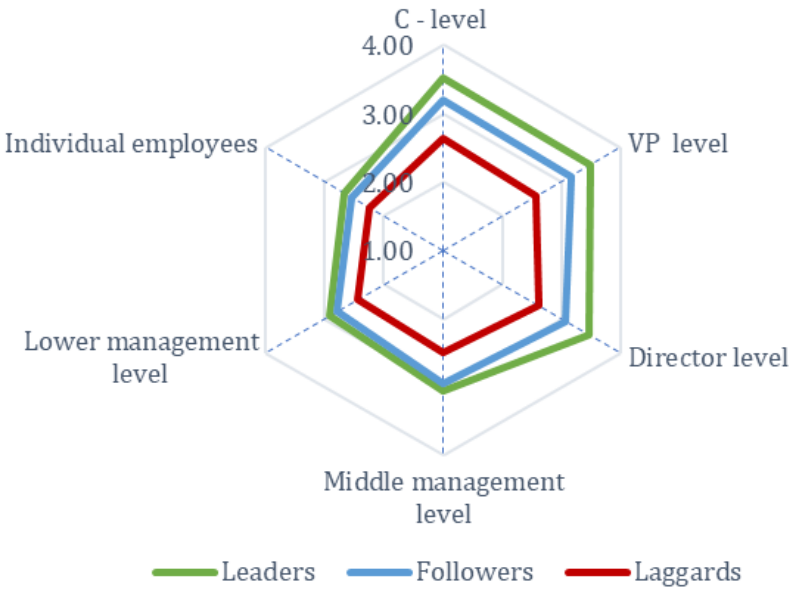

Figure 4. Financial and non-financial incentives

Figure 4 provides a snapshot of the firm's use of financial (e.g. bonuses) and non-financial incentives (e.g. awards and recognition) differentiated across the three performance groups. The survey indicates that organizations often follow a top-down approach for incentivizing corporate responsibility. Within each group, the linked incentives are often at the chief officer levels followed by the VP and director levels, with midlevel management and individual employee level incentives trailing. As such, upper management incentives are at a moderate to high levels while lower management level experience low to moderate levels of incentives. It is also important to note that leader firms offer higher levels of incentives across all levels of the organizational hierarchy. This is especially true for top management where leaders also differ from follower firms.

6.3 Integrating corporate responsibility in supply chain design decisions

As firms advance on their journey to excel at corporate responsibility, it is critical for these organizations to integrate considerations related to corporate responsibility in all aspects of their decision making. In light of this, this research evaluated the extent to which organizations prioritize aspects related to corporate responsibility in design decisions related to (a) the supply base, (b) the manufacturing network, (c) the logistics network, and (d) the reverse logistics network. Respondents were asked to rate the extent to which their firm prioritizes these CR aspects in the decision making on a five-point Likert scale (1-very low, 2 – low, 3 – moderate, 4 – high, and 5 – very high).

Table 7 provides the overall sample means and standard deviations for the items rated by the respondents. Across the complete sample, on average, firms place moderate to high levels of priority on integrating corporate responsibility concerns in their supply chain design decisions. Salient amongst these are decisions related to the manufacturing network, epically the use of eco-friendly raw materials and production technologies at existing factories. Most prioritized aspects for the supply base relate to suppliers who can provide environmentally friendly packing as well as those who provide good working conditions and a fair wage. The importance of suppliers having an environmental policy and achievements is also moderate. Emphasis on manufacturing network and supply base is followed by the emphasis on logistics and finally reverse logistics. This may be reflective of an inside-out approach, wherein organizations focus on internal operations followed by the supply base, and then the logistics and reverse logistics aspects as they integrate corporate responsibility considerations in their supply chain design decision making.

Table 7. Integrating corporate responsibility in supply chain design decisions

Integrating corproate responsibility in supply chain design decisions	Overall Sample	
	Average	St.Dev.
Supply base design decisions		
Selecting new suppliers who have an environmental policy	3.17	1.23
Selecting new suppliers who have a record of environmental achievements	3.14	1.23
Selecting new suppliers who have advances in developing environment-friendly products	3.08	1.22
Selecting new suppliers who have advances in providing environment-friendly packaging	3.23	1.21
Selecting new suppliers who provide good worker conditions.	3.22	1.24
Selecting new suppliers who use fair wages	3.16	1.23
Manufacturing network design decisions		
Establishing new factories that use eco-friendly raw materials	3.10	1.24
Establishing new factories that use eco-friendly production technologies	3.09	1.23
Establishing new factories that use eco-friendly production technologies	3.06	1.24
Encouraging current factories to use eco-friendly raw materials	3.20	1.25
Encouraging current factories to use eco-friendly production technologies	3.24	1.23
Encouraging current factories to use eco-friendly package materials	3.16	1.21
Logistics network design decisions		
Selecting distributors who have an environmental policy	3.12	1.31
Selecting distributors that have a record of environmental achievements	3.05	1.23
Selecting distributors that use eco-friendly packages	3.07	1.27
Selecting distributors who integrate ecological concerns in locating facilities (warehouses and distribution cen	3.03	1.20
Selecting eco-friendly transportation modes between facilities (suppliers, factories, and distributors)	3.18	1.27
Reverse logistics design decisions		
Establishing collection/acquisition centers	2.97	1.26
Establishing inspection/sorting centers	3.09	1.33
Establishing reprocessing plants	3.06	1.36

This information broken down by performance category, and aggregated by supply chain areas, including supply management, manufacturing, and logistics (forward and reverse) is provided in Figure 8. The overarching message derived from these graphs is that leaders are consistently more proactive in integrating corporate responsibility considerations in all aspects of supply chain design decisions. Specifically, leaders place moderate to high level of priority on corporate responsibility in making manufacturing network design decisions and supply base design decision, while placing moderate priority on logistics and reverse logistics decisions. Followers were often at levels of integration close to but below that of leaders, except for manufacturing decisions. Here leading firms clearly have made the most stride in the integration of corporate responsibility and design decisions. Laggards were significantly behind along all aspects.

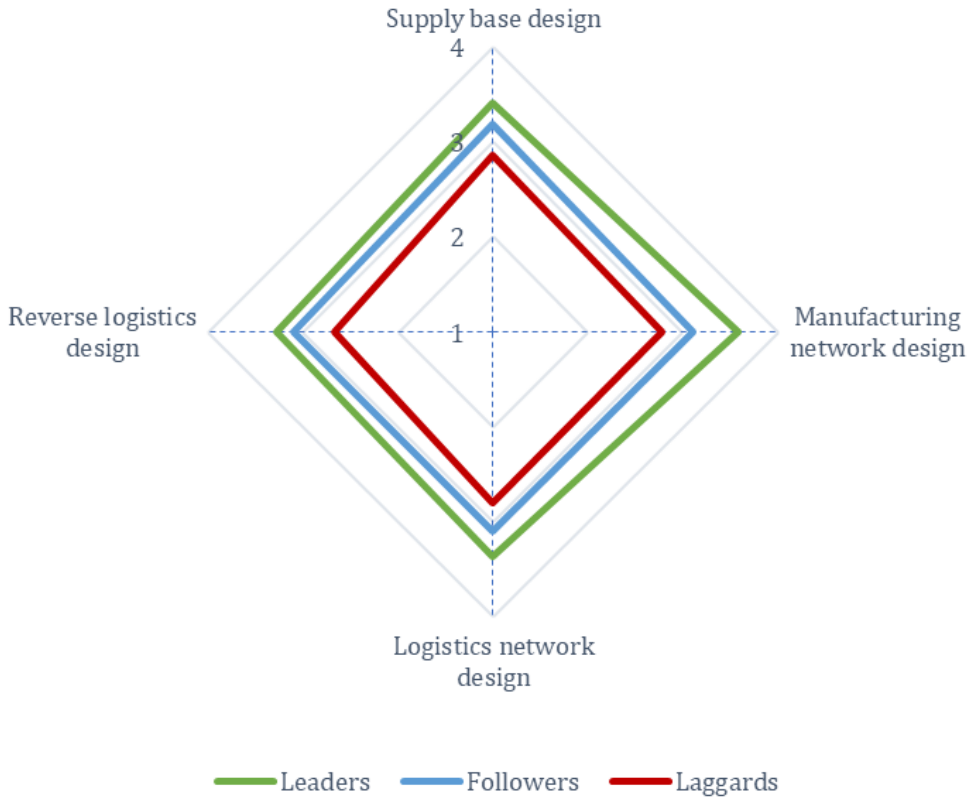

Figure 5. Integrating corporate responsibility in supply chain design decisions

6.4 Product stewardship

Development of products that incorporate ecological considerations in the design and are more sustainable is core to corporate responsibility with all groups of firms giving this significant emphasis. The survey asked respondents to rate the extent to which they prioritized eco-design in their firms. Respondents were asked to provide their agreement with statements related to product stewardship on a five-point scale (1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, and 5 – strongly agree). The overall sample average and the standard deviation is shown in Table 8. Overall, moderate to high emphasis is placed by firms across the sample. However, leader firms place moderate to high emphasis as indicated by the strong agreement to the statements shown in Table 8 by respondents at firms categorized as leader firms.

Table 8. Product stewardship

Product Stewartship	Overall Sample		Leaders	Followers	Laggards
Our firm…..	Average	St.Dev.	Average	Average	Average
designs products to reduce consumption of raw materials	3.64	1.00	4.03	3.51	3.51
designs products to avoid use of hazardous materials	4.01	0.98	4.31	3.92	3.89
designs products to use environment-friendly components/materials	3.78	0.94	4.11	3.69	3.63
designs production process to reduce consumption of raw material	3.83	0.97	4.14	3.76	3.63
designs production process to reduce use of energy	3.87	0.97	4.06	3.86	3.69
designs production process to use environment-friendly components/materi	3.73	0.98	4.11	3.58	3.66

In addition to the emphasis on product stewardship, the survey also captured information on the frequency with which firms engage in using tools known to help with the ecological design of new products. Respondents rated tool usage frequency on a five-point Likert scale (1 – never used, 2 – rarely used, 3 – occasionally used, 4 – frequently used, and 5 – always used). Figures 6 present the extent to which three identified firm groups use ecological design tools overall, while the use of specific tools is represented in Figure 7. Leader firms tend to use eco-design concepts and tools to a larger extent as compared to the follower and laggard firms. Most salient difference between leaders and laggard firms is in the implementation of cradle-to-cradle design thinking as well as design for disassembly. Both of these areas can help a firm go beyond end-of-life thinking to truly incorporate ecological concerns in new product development.

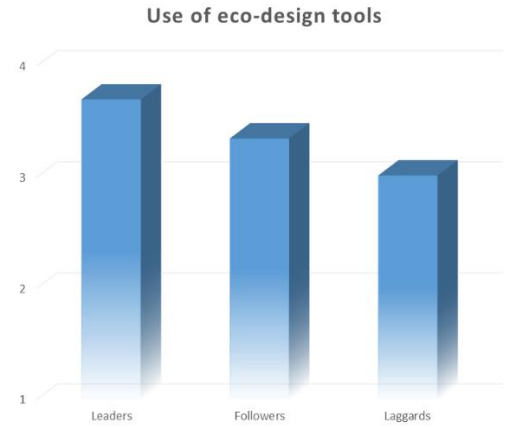

Figure 6. Use of eco-design tools

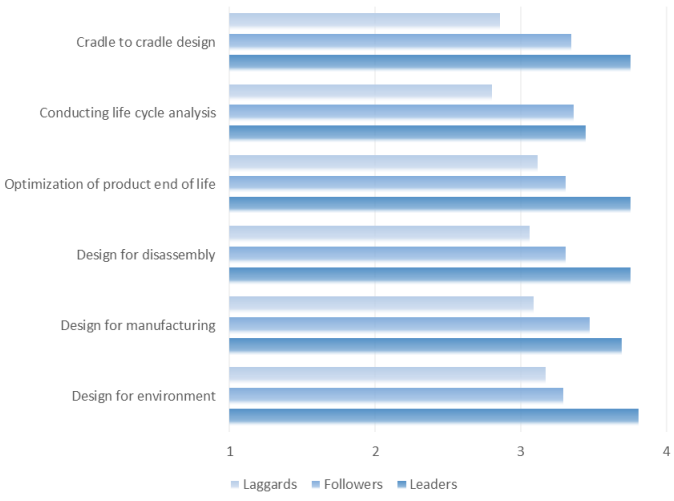

Figure 7. Specific eco-design tools used

6.5 Supply chain collaboration for corporate responsibility

A key element of successful supply chain management is collaboration within and across firms. This is also true for corporate responsibility. Indeed, for firms to have supply chains that exemplify corporate responsibility, collaboration for aspects of sustainability is essential. With this in mind, the survey asked respondents to rate the level of collaboration that existed (a) within the firm across functions, (b) between the firm and its suppliers, and (c) between the firm and its customers, with respect to various aspects that reflect collaboration. Ratings for collaboration were on a five-point Likert scale (1- very low, 2 – low, 3 – moderate, 4 – high, and 5 – very high).

Table 9. Collaboration for corporate responsibility across the supply chain

Collaborations across the supply chain	Cross-functional		Supplier		Customer	
	Average	St.Dev.	Average	St.Dev.	Average	St.Dev.
Greenhouse Gas Reporting	2.85	1.29	2.73	1.37	2.77	1.38
Pollution Prevention	3.09	1.24	3.04	1.39	3.07	1.38
Natural resource use	3.14	1.23	3.00	1.38	3.05	1.38
Energy conservation	3.23	1.21	3.14	1.34	3.03	1.37
Increasing recycling of materials	3.29	1.23	3.13	1.36	3.10	1.37
Managing chemical compliance	3.27	1.26	3.17	1.31	3.10	1.37
Managing chemical disposal	3.24	1.27	3.04	1.38	3.06	1.38
Conflict minerals reporting	3.03	1.31	3.10	1.35	3.05	1.44
Forced/bonded labor issues in the supply chain	2.82	1.39	2.83	1.42	2.83	1.47
Traceability of environmental impact in the supply chain	3.03	1.30	2.94	1.34	3.03	1.38
Traceability of human rights issues in the supply chain	2.83	1.36	2.76	1.40	2.77	1.37
Verification of environmental claims in the supply chain	3.05	1.26	2.97	1.42	2.90	1.34
Verification for fair human treatment in the supply chain	2.80	1.36	2.82	1.43	2.84	1.43

Table 9 provides the average ratings across the complete sample. On average, firms report moderate or close to moderate levels of collaboration internally (i.e. cross-functional) and externally (i.e. with suppliers and customers). This is broken down by the three groups of firms and presented in Figure 8.

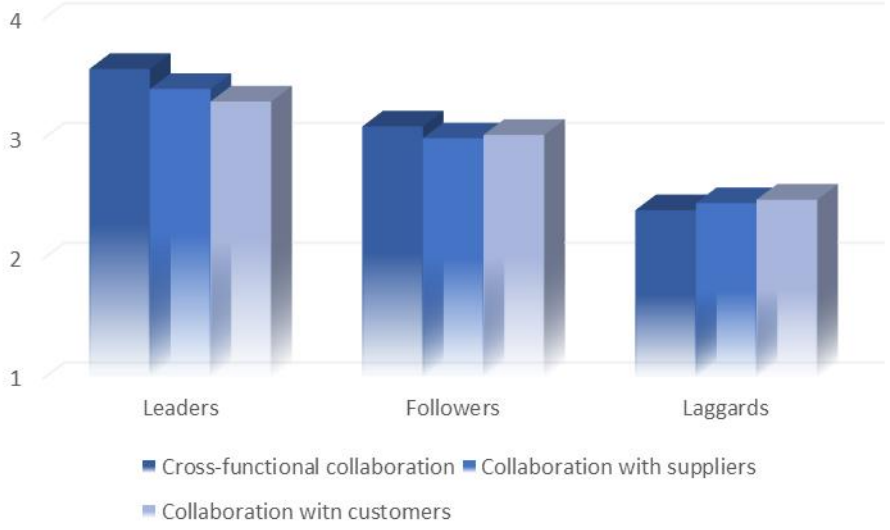

Figure 8. Supply chain collaboration for corporate responsibility

As seen in Figure 8, leader firms tend to have moderate to high levels of collaboration within the firm and with suppliers/customers, while laggard firms tend to engage in low levels of collaboration. Interestingly, Figure 8 also indicates that leader firms lay the highest emphasis on cross-functional collaboration, followed by the collaboration with suppliers and then collaboration with customers. However, laggard firms follow the opposite pattern. This may be indicative of the notion that leader firms tend to drive internal change for corporate responsibility, learn and develop expertise, and then propagate these changes to their suppliers and customers, while laggard firms are adopting an outside-in approach.

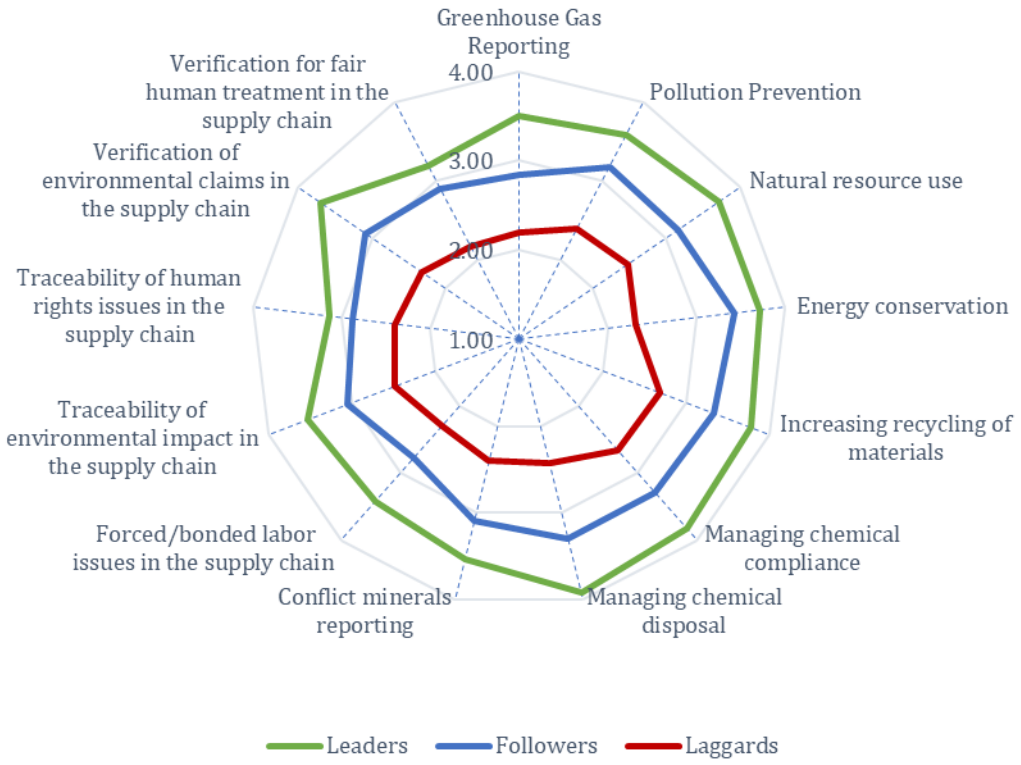

Figure 9. Cross-functional collaboration for corporate responsibility

Figures 9, 10 and 11 present the spider-graphs broken down by corporate responsibility initiatives for which collaboration was assessed, as well as by firm groups. A consistent pattern emerges across all three figures in terms of leader firms engaging in higher levels of collaboration while engagement is lower by laggard firms. Interestingly, leader firms put the most efforts for cross-functional collaboration on aspects related to chemical management, and resource conservation, this is followed by an emphasis on collaboration for the environment and followed by collaboration on social issues. Similar patterns are evident for the follower and laggard firms for cross-functional collaboration. In terms of collaborating with suppliers and customers, leader firms again engage in higher levels as compared to the follower and laggard firms. However, the emphasis placed on most activities is rather consistent across the types of activities (see Figure 10 and Figure 11).

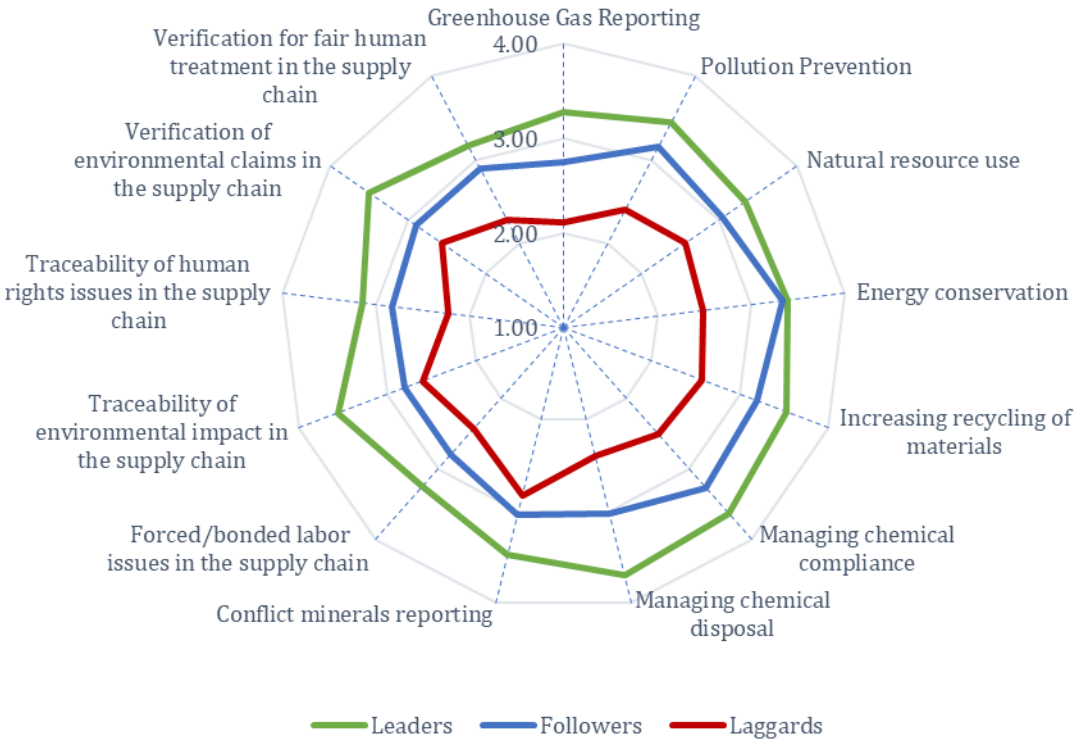

Figure 10. Supplier collaboration for corporate responsibility

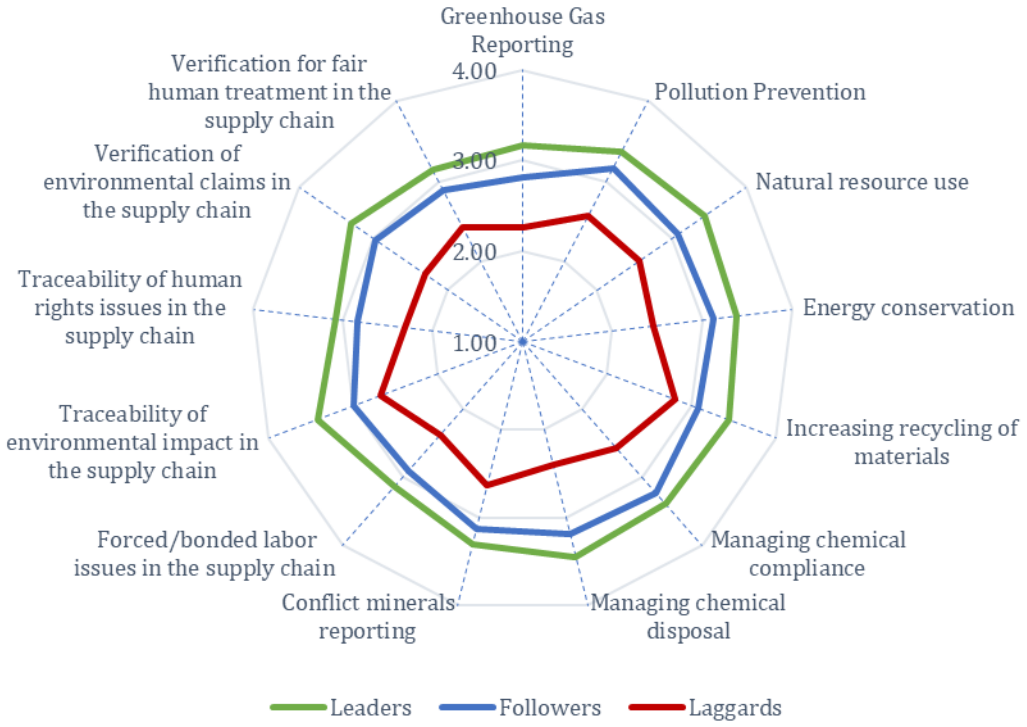

Figure 11. Customer collaboration for corporate responsibility

6.6 Supply base capability for corporate responsibility

A supply base that is capable and demonstrates a high level of corporate responsibility is critical for the functioning of major manufacturing OEM's. In order to assess the capability of the supply base with respect to corporate responsibility this study asked survey respondents to indicate the percent of their firm's supply base proficient on four indicators including (a) ISO 14000 certification, (b) ability to provide ecological proof for their products, (c) have employees that are trained in environmental regulation and (d) cooperate with their customers (i.e. downstream firms) for environmental initiatives. Respondents provided their assessment on a five-point scale (1-less than 20%, 2 – 20-39%, 3 – 40-59%, 4 – 60-79%, and 5 – greater than 80%) that indicated the % of the firm's supply base with these capabilities.

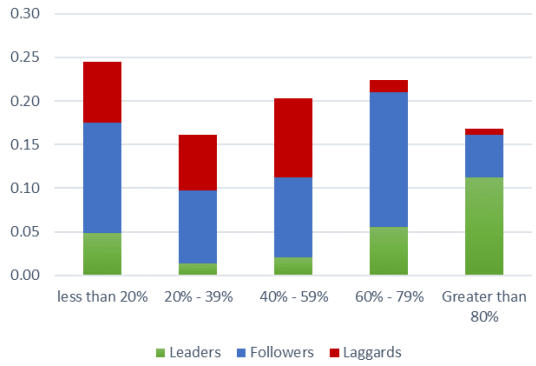

Figure 12. ISO 14000 certified

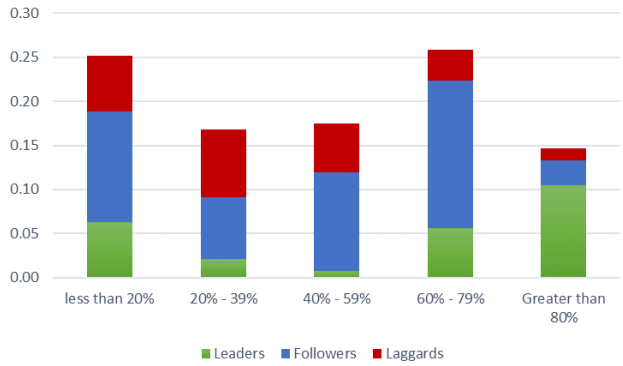

Figure 13. Able to provide ecological proof for products

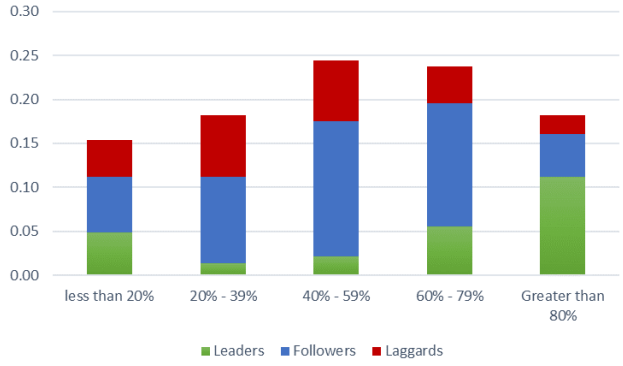

Figure 14. Have employees trained in environmental regulation

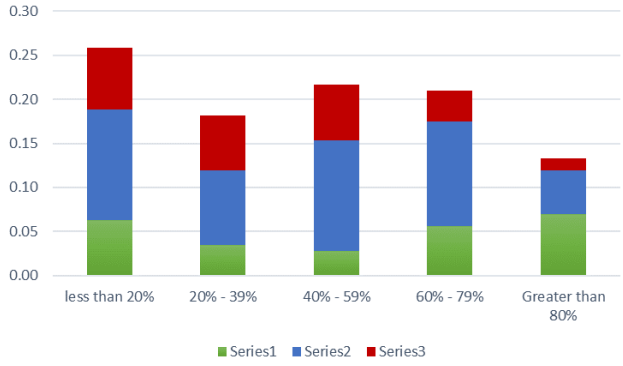

Figure 15. Cooperate with their customers to reduce environmental impact in the manufacturing process

Figures 12 – 15 provide the frequency stacks of the responses (broken down by firm groups) with the y-axis displaying the proportion of respondents. Approximately 40 percent of the firms in the sample report that 60% or more of their supply base as having ISO 14000 certification, have the ability to provide ecological proof of products and with employees trained in environmental regulations. Additionally, 34 percent report that most of their supply base (> 60%) is willing to cooperate on reducing the environmental impact of the supplier's operations. Interestingly, of these, the largest proportion comes from the leading

firms. A clear trend where leader firms have larger proportions of their supply base that is capable while laggard firms typically have less than 40% of their supply base as capable, with a number of them having less than 20% of the supply base as capable of managing internal operations for corporate responsibility.

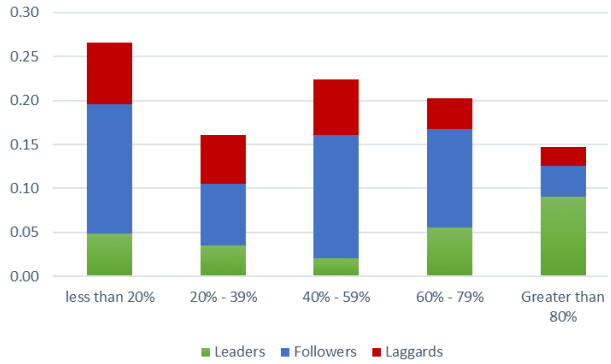

Figure 16. Incorporate environmental considerations in selecting second-tier suppliers

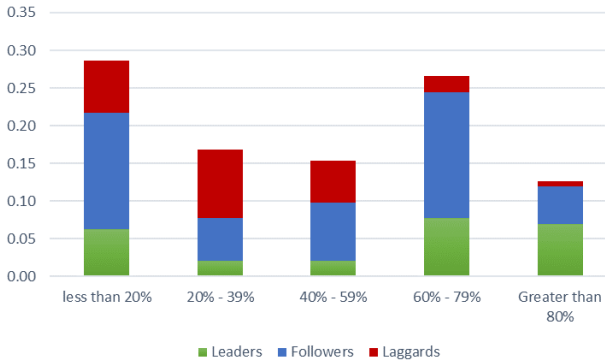

Figure 17. Conduct second-tier supplier environmental evaluation

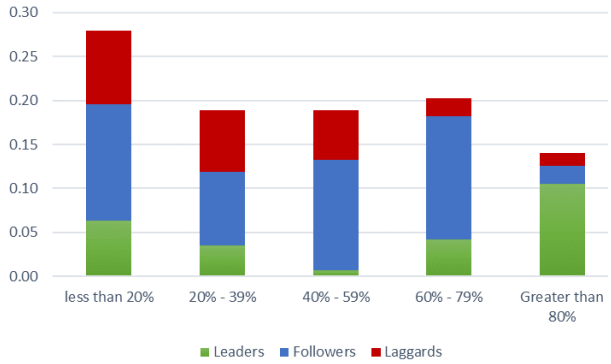

Figure 18. Audit second-tier suppliers for environmental practices

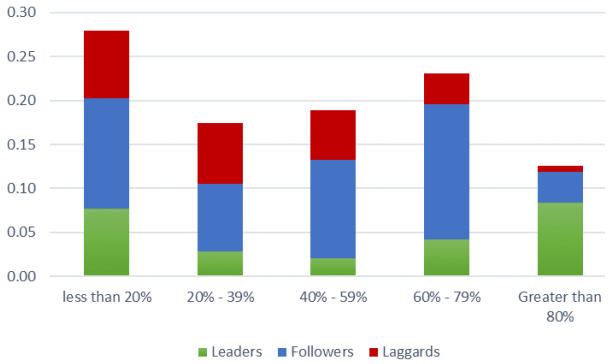

Figure 19. Audit second-tier suppliers human rights practices

Survey respondents were also asked to respond regarding their tier-one supplier's practices for managing tier two suppliers. Specifically, four aspects of whether tier one suppliers (a) incorporate environmental considerations in selecting tier two suppliers, (b) conduct second-tier supplier environmental evaluations (c) audit second-tier suppliers for environmental practices, and (d) audit second-tier suppliers for human rights practices were assessed. Figures 16-19 provide the frequency stacks of the responses (broken down by firm groups) with the y-axis displaying the proportion of respondents. Approximately 30 to 35 percent of respondents indicate that more than 60% of their supply base as capable of managing corporate responsibility in the extended supply chain. This proportion is smaller when compared to the proportion that reports the tier one supplier as capable of corporate responsibility which is not surprising. This, however, indicates that there is more scope for permeating improvements for corporate responsibility in the extended supply chain. Important to note is that a similar trend exists, wherein the firms which report higher proportions of their supply chains as capable of managing corporate responsibility in the extended supply chain are leader firms.

Table 10. Firm practices for monitoring and evaluation of suppliers for CR

Monitoring and Evaluation of Suppliers for CR	Overall Sample	
	Average	St.Dev.
Formal evaluation system to assess suppliers' environmental performance	2.94	1.36
Supplier audits for environmental practices	2.93	1.33
Encouraging suppliers to have ISO 14000 series certification	2.95	1.45
Assessment of suppliers' initiatives for responsible treatment of workers	2.86	1.39
Assessment of suppliers' human rights practices	2.95	1.47
Use of supplier audits for labor issues (child labor, work conditions)	2.94	1.53
Use of supplier audits for fair labor wage determinations	2.99	1.61

While the initial set of questions assessed the capability of the firm's supply base, we also asked respondents to provide information on the extent to which they utilize monitoring and evaluation for corporate responsibility on their tier one suppliers. For the items in Table 10, respondents provided their assessment on a five-point scale (1-less than 20%, 2 – 20-39%, 3 – 40-59%, 4 – 60-79%, and 5 – greater than 80%) that indicated the % of the firm's supply base which underwent evaluation and monitoring for corporate responsibility. Across the complete sample, the average of all items is very close to 3, indicating that likely approximately 40% or less of the suppliers are experiencing corporate responsibility related evaluation and monitoring for an average firm in the sample.

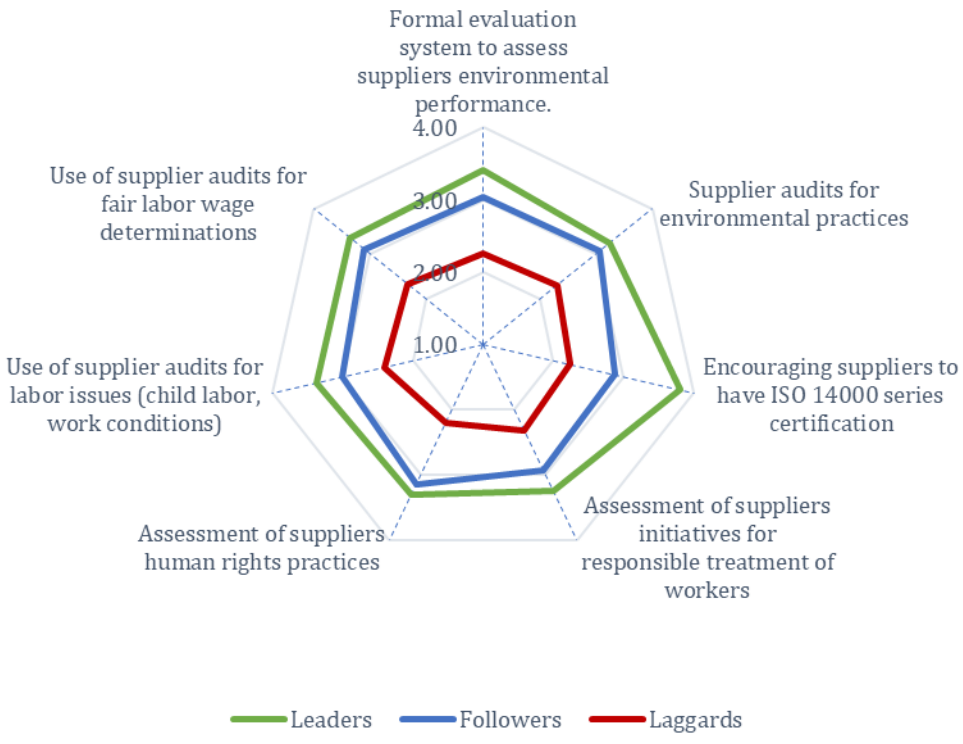

Figure 20. Supplier monitoring and evaluation practices for corporate responsibility

A more fine-grained picture is provided in the spider-graph in Figure 20. This breaks down the individual practices by the firm groups. For leader segment firms, note that the average responses are between 3 and 4, indicating that these firms have evaluation and monitoring practices for CR implemented across approximately 40 – 60% of their suppliers. Most prominent practice relates to encouraging suppliers to have ISO 14000 certification wherein for leader firms this metric shows close to 60% coverage of the supply base. In general, leader firms are more mature in the use of these practices and have permeated them through larger proportions of their supply base.

Table 11. Firm practices for supplier development for CR

Supplier development for CR	Overall Sample	
	Average	St.Dev.
Our firm offers training for suppliers personnel to improve environmental perf.	2.99	1.35
Our firm offers training to suppliers for managing toxic materials	3.08	1.38
Our firm educates suppliers about corporate responsibility	3.11	1.35
Our firm educates suppliers for responsible chemical management	3.09	1.39
Our firm offers assistance to suppliers for pollution control	2.98	1.46
Our firm visits suppliersâsites to help improve environmental performance	3.13	1.35
Our firm collaborates with suppliers on sustainability related projects	3.09	1.33

In addition to the practices for evaluation and monitoring, respondents were also asked the frequency with which their firms' engage in practices indicative of supplier development. Typically, firms may develop supplier performance via offering education and training (e.g. via providing information and reading materials), conducting site visits (e.g. for identifying opportunities for improvements), collaborating on sustainability-related projects, or offering assistance for performance improvement. Respondents provided their assessment of the frequency with which firms used such practices on a five-point scale (1-Never, 2 – Rarely, 3 – Sometimes, 4 – Frequently, and 5 – Very frequently). Table 11 provides the overall sample averages for the responses, indicating the moderate use of supplier development for corporate responsibility.

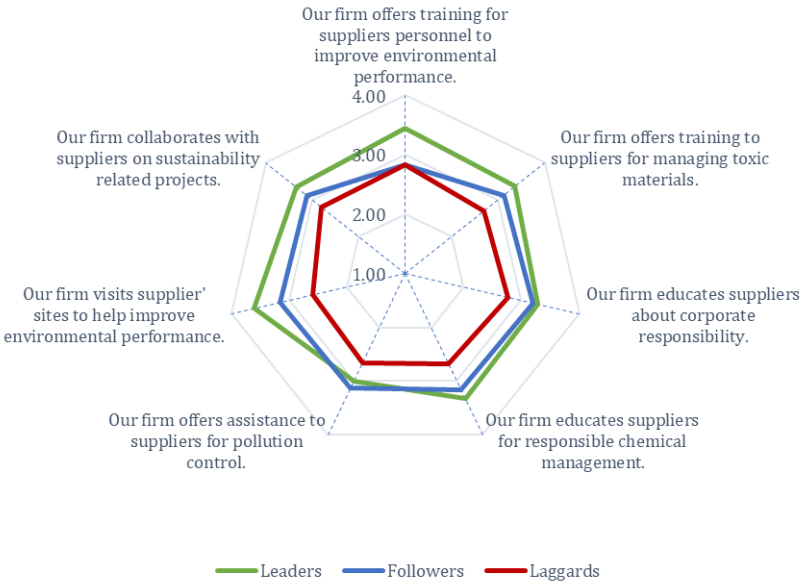

Figure 21. Supplier development for corporate responsibility

Figure 21 provides a detailed breakdown by groups of firms categorized as leaders, followers, and laggards. Interestingly leader and follower firms are equally mature in providing training and education to their suppliers, indicating that these firms see the development of suppliers via training as critical for improving corporate responsibility in the supply base. Notably, there is a distinction with respect to offering training for environmental performance improvements. Leader firms engage in this more frequently while follower firms are similar to laggards in this aspect. It is also interesting to note that leader firms engage in a more collaborative approach with their supplier for developing them as well as conduct site visits more frequently as compared to the follower and laggard firms.

7. Conclusion

As organizations strive to develop their internal operations and supply chain to function in line with corporate responsibility, a thorough understanding of the state of industry practices is critical. It is also important to identify whether there is a clear pattern of tangible and intangible benefit from implementing corporate responsibility practices. The benchmarking study reported in this executive summary was aimed at generating a deeper understanding of these dimensions. Overall, there is a clear pattern evident wherein firms that are implementing higher levels of corporate responsibility practices within internal operations and across the supply chain are also better at balancing business and corporate responsibility performance (i.e. labeled leader firms). The experience reported by these leader firms provides an impetus for more organizations to pursue the implementation of corporate responsibility practices.

This report also provides detailed insight into current industry practices and should enable firms which hope engage in the pursuit of corporate responsibility practices (or improve upon their current state) to identify practices typical of leading firms. Hopefully, this report will provide you with insight that can help your organization improve their corporate responsibility endeavors.

8. Acknowledgments

I am very thankful to the Automotive Industry Action Group, specifically Mr. J. Scot Sharland and Mr. Joel Karczewski for supporting this research project. I also thank all the respondents of the survey for their willingness to share their firm's experience with corporate responsibility. I sincerely hope that this research report is useful to the readers. I also wish to thank Dr. Yuan Wang and Dr. Saurabh Mishra who provided valuable feedback on earlier versions of the survey that was used to conduct this research.

9. Author biography

Dr. Sachin Modi is a Professor of Supply Chain Management at the Mike Ilitch School of Business at Wayne State University. His research focuses on complex manufacturing and service operations with specific emphasis on quantifying the financial value of operations capability, sustainability, and sourcing. He received his Ph.D. in Business with a dual major in Operations Management and Decision Sciences from the Kelley School of Business at Indiana University. Prior to joining Wayne State University, he held faculty positions at Iowa State University and the University of Toledo. During his career, he also spent multiple years in consulting, working at Kanbay Inc. (now a division of Capgemini) and i2 Technologies (now JDA Software Inc.). His research publications have appeared in several leading academic business journals including the *Journal of Operations Management, Production, and Operations Management Journal, the Journal of Marketing, the Journal of Business Ethics, the Journal of Business Logistics* and *the Journal of Supply Chain Management*.