

Dependent Variable

Supply chain transparency was measured with the manufacturers' ability to report data about GHG emissions intensity from their upstream growers' operations. For example, as in Figure 2, in the Milk category assessment, the question asked to the food manufacturer regarding GHG emission is: What was the greenhouse gas emissions intensity associated with the animal farm operations and feed producers in your supply chain?

Figure 1. THESIS Example

9. GREENHOUSE GAS EMISSIONS INTENSITY - ANIMAL FARM OPERATIONS	
Question	Response Options
What was the greenhouse gas emissions intensity associated with the animal farm operations and feed producers in your supply chain?	A. We are unable to determine at this time. B. Our greenhouse gas emissions intensity was: B1. _____ kg CO2e per metric tonne of milk. B2. _____ % of our milk supply, by mass, is represented by the number reported above.

There is extensive guidance provided for answering the KPI (see Table 2). B2 quantifies transparency by calculating the percentage of a manufacturer's total crop supply for which primary GHG emissions data are available, reflecting the extent of direct oversight and data acquisition in their supply chain. B2 is computed by dividing the mass of the crop supply covered by primary data by the total mass of the crop supplied, then multiplying by 100. A high percentage in B2 indicates a higher level of transparency. Conversely, a lower percentage suggests reduced transparency, indicating reliance on generalized or less current data. Suppliers responding "Unable to determine" were assigned a zero for transparency.

## Independent Variables

In this study, independent variables were operationalized to assess their effect on extended supply chain transparency. Firm Size has the categories of annual revenue less than 1 million USD, 1-10 million USD, 10-100 million USD, 100 million-1 billion USD, or greater than 1 billion USD. Firm Type distinguishes between public and private companies. Sustainability Team has the categories of no team, or team size of 1 to 2, 3 to 5, 6 to 10, 11 to 20, or more than 20. Disclosure indicates whether the firm has a publicly available sustainability report or not. Sustainability Interest was operationalized using the question "Select the main reason(s) your organization participates in THESIS". Out of the following 7 response options, "Use results as part of internal sustainability activities", "Use results as part of external sustainability activities", "Respond to buyer/customer requests", "Evaluate my organization's performance", "Benchmark against competitors", "Engage our supply chain to collect data", and "Receive analytics", those that only chose "Respond to buyer/customer requests" were coded as having low sustainability interest.. Past Experience was operationalized with the number of years that final manufacturer had participated in THESIS. Other Experience was operationalized as the number of different (non-THESIS) reporting systems used by final manufacturers for reporting data. Respondents could indicate their use of the following platforms: LIST THE RESPONSE OPTIONS. Information Source was operationalized with the question "Which of the following methods did you use for assessing/completing supply chain related KPIs?". Response options ranged from "We used previously assembled supplier data", "We attempted to contact most or all of our suppliers", "We used modeled data (e.g., LCI databases)", "We engaged our

largest suppliers”, “We did not collect any supply chain data for the purpose of answering KPIs”, “We used secondary data (e.g., regional averages)”, and “Other.” Based on the responses, respondents that chose “We attempted to contact most or all of our suppliers” were coded as 3, respondents that chose “We used previously assembled supplier data” and “We engaged our largest suppliers” were coded as 2, respondents that chose the option “We used secondary data (e.g., regional averages)”, and “We used modeled data (e.g., LCI databases)” were coded as 1, and those that didn’t respond or chose the options of “Other” or “We did not collect any supply chain data for the purpose of answering KPIs” were coded 0.

The following are the control variables that I used.

Variable Name	Description	Measurement
Product Category	KPI Category	Animal Base Foods, Apples and Pears, Beans Lentils and Peas, Beef, Berries and Grapes, Chicken, Citrus, Coffee, Complex Foods and Beverages, Cookies and Baked Goods, Cucumbers Melons and Squash, Dairy, Eggs, Farmed Fish, ..., Wild-caught Shellfish
Corporate Sustainability Performance	Average of other THESIS scores related to extended supply chain transparency	Average of all KPIs related to extended supply chain transparency scores such as downstream water use intensity, nutrient management collected by THESIS.

GHG Planning Maturity	The final manufacturer's participation in SBTi	Whether the final manufacturer has SBTi certified goals to reduce scope 1, 2, and 3 GHG emissions.
Contract Manufacturer	Questionnaire "Select ownership of the facilities that produce the final/end product(s) for your organization"	Responses of "Contract facilities" and "Both owned and contract facilities" were considered as contract manufacturing
Number of Sourcing Continents	The variation of sourcing continents	The number of continents a company source from
Supply Chain Transparency Interest	Questionnaire "Which of the following do you consider to be top sustainability priorities for your organization for the next year?"	Responses including "scope 3" or "supply chain transparency" was considered as having supply chain transparency interest
Category Competition	The degree of competition in each KPI category	The number of suppliers responding to a category assessment or KPI set