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Responsible Innovation Management in Profit-Driven Firms: A Cross-Cultural Analysis in Germany, India, and Japan

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ABSTRACT

Responsible innovation (RI) challenges profit-driven firms to reconcile market pressures with societal and environmental responsibilities. We ask how firms integrate anticipation, reflexivity, inclusion, and responsiveness (ARIR) into responsible innovation management (RIM), and how national context and cultural dimensions shape the degree and form of RIM. Using inductive grounded theory, we conducted 60 semi-structured interviews with innovation managers and senior decision makers in multinational firms in Germany, India, and Japan. We develop a culturally anchored conceptual model in which external environments shape national dominant innovation foci, and both national innovation focus and cultural values act as antecedents of ARIR enactment, with top management's RI advocacy amplifying integration when responsibility is not institutionally dominant. Cross-national comparisons reveal pillar-specific patterns. German firms show broad ARIR alignment across all four pillars. Japanese firms exhibit a high degree of ARIR integration, but a form of RIM in which governance emphasis falls on anticipation, reflexivity, and inclusion, with responsiveness less developed as a proactive routine. Indian firms exhibit more variable alignment that strengthens when top management champions RI. By theorizing RIM as a process-centric, variance-sensitive construct and explaining its cultural contingencies, the study advances innovation management research on how firms institutionalize RI under persistent economic-responsibility tensions.

1 | Introduction

Responsible Innovation (RI) emphasizes the alignment of innovation processes to balance economic gains and broader societal and environmental impact (Stilgoe et al. 2013; von Schomberg 2013). This balance highlights an inherent tension, as innovation has its bright and dark sides (Stilgoe et al. 2013; Zhang et al. 2024). Across settings, managers face a common paradox: actions that improve revenue, speed, or cost also raise societal and environmental obligations.

In Germany's electric vehicle value chain, for example, battery and auto firms race to capture growth. Yet, the new EU Batteries Regulation (EU 2023/1542) compels full life-cycle due diligence (carbon-footprint disclosure, recycling targets), forcing redesigns and investments that slow time-to-market, an anticipation/responsiveness trade-off firms must manage (e.g., de Waal 2025; Rizos and Urban 2024; European Court of Auditors 2023). In India, the UPI-Aadhaar (Unified Payments Interface) digital public infrastructure enables ultra-low-cost, real-time payments at a massive scale (15B+ transactions/

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Managerial Summary

Innovating responsibly is difficult when speed, cost, and growth dominate. We interviewed 60 innovation managers and top-level decision makers in large multinational firms in Germany, India, and Japan to learn how companies build responsibility into everyday innovation decisions. We found four repeatable practices: looking ahead to likely impacts, pausing to question assumptions, involving affected stakeholders early, and changing course when new risks or expectations emerge. National context matters. In Germany, regulation and sustainability expectations support all four practices. In Japan, companies are strong at planning ahead, reflecting on their practices, and coordinating with stakeholders. However, the routines for adjusting course when new societal or environmental concerns emerge are less well established. In India, cost and time pressure often limit these practices unless senior leaders actively champion responsible innovation and embed it in goals, policies, and investment decisions. For managers in large multinational for-profit firms and policymakers, the message is to make responsibility a routine part of how innovation decisions are made, tailor it to local expectations, cultivate top management advocacy for responsible innovation, and give teams the authority, time, and resources to act on concerns early and to stop, redesign, or redirect projects when needed.

month), yet raises privacy risks that require inclusion and reflexivity in innovation processes (Cornelli et al. 2024; Masiero and Arvidsson 2021). In Japan, firms started to deploy care/service robots in hotels or nursing homes to sustain quality amid labor shortages. Economic benefits are clear, but ethical concerns around autonomy, safety, and privacy require strong anticipation and staged roll-outs (Deusdad 2024; Ide et al. 2024). These real-world examples illustrate the economic-responsibility paradox in mainstream innovation and show how national context and culture might shape firms' integration of anticipation, reflexivity, inclusion, and responsiveness (the ARIR framework; Stilgoe et al. 2013) into innovation management. Such real-world situations support ecological validity (van Heerde et al. 2021) and motivate our central focus on how profit-driven firms integrate the ARIR principles into innovation management to balance economic with societal and environmental objectives, and how the degree and form of such responsible innovation management (RIM) vary across national contexts and cultural values.

Although RI intersects with CSR and sustainable/green innovation, it is distinct in its process-oriented focus on governing innovation through ARIR integration. Extant RI scholarship has advanced a process-oriented governance framing for aligning innovation with and for society, most prominently via the ARIR principles (Owen et al. 2012; Stilgoe et al. 2013; von Schomberg 2013). Prior work, largely developed in the responsible research and innovation (RRI) tradition and studied in publicly funded research/policy initiatives and selected high-stakes settings, shows that enacting RI requires structured foresight and impact assessment (anticipation), explicit questioning of values and assumptions (reflexivity), purposeful stakeholder deliberation (inclusion), and the capacity to adapt innovation

trajectories as new concerns emerge (responsiveness) (Stilgoe et al. 2013). Since innovation decisions are made upstream under high uncertainty and speed-to-market pressures, and since externalities are often delayed and distributed, responsibility should not be treated as a generic good practice but must be operationalized as innovation-process governance routines.

The RI literature provides a strong normative and process foundation for governing innovation through ARIR mechanisms. However, much of this work is grounded in publicly funded research (e.g., Owen et al. 2021), policy initiatives (e.g., Horizon Europe), or high-stakes technology domains like health-tech or AI, and it offers limited explanation of how profit-driven firms institutionalize ARIR as a systematic innovation governance capability under market pressure (Spanjol et al. 2024). Because ARIR is inherently process-centric, the key theoretical challenge is not whether responsibility matters, but how it becomes embedded (to varying degrees and in different forms) in day-to-day innovation management, and how this embedding varies across national and cultural contexts. This poses three key research gaps.

First, while existing literature acknowledges the economic-responsibility paradox in innovation (Hahn et al. 2018), we know little about how profit-driven firms integrate the ARIR principles into innovation management, that is, the degree and specific ways they enact RIM to manage tensions between economic goals and social-environmental responsibility.

Second, we lack a culturally informed understanding of how national context and cultural dimensions act as antecedents that shape firms' degree and form of RIM, including the role of a country's dominant innovation focus.

We conceptualize the degree of RIM as the breadth and consistency with which ARIR is embedded across the innovation process, from idea generation to development and implementation. The degree is high when responsibility spans the entire innovation process from ideation through commercialization and lower when firms engage all four pillars selectively or inconsistently across projects, stages, or units. We conceptualize the form of RIM as the particular configuration through which RIM is enacted, varying along two sub-dimensions: pillar emphasis (which ARIR pillars a firm prioritizes) and governance mechanisms (the organizational routines and decision-making structures through which those pillars are put into practice). For instance, one firm might prioritize anticipation and responsiveness through formal stage-gate review processes while placing less emphasis on broad societal inclusion. Another might rely on consensus-based decision-making across management levels and alliance partners to enact inclusion and reflexivity. As our findings will show, these configurations differ across national contexts in ways that reflect underlying institutional and cultural conditions.

Third, we lack a theoretically informed, cross-cultural model that positions culture and national innovation focus upstream of RIM and places tension management outcomes at the center of analysis. To address these gaps, we pose two research questions. RQ1: To what degree and in what ways do profit-driven firms integrate the ARIR principles of anticipation, reflexivity,

inclusion, and responsiveness into responsible innovation management (RIM) to balance economic with societal and environmental objectives? RQ2: How do national context and cultural dimensions act as antecedents that shape these firms' degree and form of RIM?

Our unit of analysis is the firm's innovation management process. We collect firm-level evidence via interviews with innovation managers and top-level decision makers, who act as knowledgeable informants about organizational processes, treating national context and cultural dimensions as country-level antecedents that shape firms' degree and form of RIM.

We combine our current understanding of RI from extant literature with qualitative research conducted with 60 innovation managers and top-level decision makers in large, multinational, for-profit firms in Germany, India, and Japan, across a variety of industries. We selected these countries for three reasons. First, these countries vary on multiple cultural dimensions (e.g., Hofstede 2001; Inglehart et al. 2000), providing a rich cross-cultural context to address our research questions. Second, Germany and Japan are mature economies, while India is a high-growth, emerging economy, and each has a different dominant innovation focus. Third, given that the concept of RI was originally nurtured in Europe, we included a European country (Germany) and two non-European countries (India and Japan) as a contrast.

Addressing RQ1, our findings show that RIM manifests as the systematic integration of the ARIR mechanisms into innovation management, enabling firms to manage tensions across financial, social/ethical, and environmental objectives. Addressing RQ2, we observed substantial cross-national variation in both the degree and the form of ARIR integration into innovation management processes. We explain cross-national variation in the degree and form of RIM through the antecedent roles of (a) external environments and national dominant innovation foci, (b) cultural dimensions and values, and (c) top management's RI advocacy as an amplifying condition where institutional support for responsibility is weaker. Building on these findings, we develop a culturally informed conceptual model of RIM in profit-oriented firms and derive implications for implementing ARIR across national and cultural contexts.

Our research makes three major theoretical contributions. First, it extends the theoretical framework of RI, which has largely focused on publicly funded scientific research, policy initiatives, or firms in tech-specific industries, to the context of a broad range of global profit-driven firms across diverse sectors. We conceptualize and empirically unpack Responsible Innovation Management (RIM) as the degree and form with which firms integrate ARIR into innovation management to address the economic-responsibility tension. Second, we develop a culturally anchored explanation of cross-national variation by theorizing national context, cultural dimensions/values, and national dominant innovation focus as antecedents shaping firms' RIM. Third, we show how differences in RIM relate to firms' tension management across financial, social/ethical, and environmental dimensions, and we highlight top management's RI advocacy as a key enabling condition in contexts where responsibility is not institutionally dominant.

Managerially, our findings suggest that innovation managers should tailor RIM to their national and cultural context, build top leadership advocacy for RI, and design ARIR routines that fit the institutional environment of each operating subsidiary. Section 5.2 elaborates on these practical implications.

2 | Theoretical Foundations

2.1 | RI Research and Key Themes

Innovation in profit-driven firms is shaped by enduring tensions between economic performance and societal stewardship, speed-to-market and inclusive deliberation, novelty and precaution, and global scale and local values. The four pillars of responsible innovation (anticipation, reflexivity, inclusion, and responsiveness) serve as process mechanisms for addressing these paradoxes across the innovation lifecycle. We use this paradox lens to organize our review and to motivate our research questions and model.

The editorial of this special issue provides a comprehensive review of the emergence of RI, its normative foundations, and the ARIR framework (see also Owen et al. 2012; Stilgoe et al. 2013; von Schomberg 2013). We therefore focus here on identifying key themes and gaps in the RI literature that motivate our study. Online Appendix A summarizes the key differences between traditional innovation and responsible innovation.

Our review of the extant RI literature reveals multiple key themes and focus areas. First, most of the early research focused on the conceptual development and theoretical foundations of the concept (van den Hoven and Doorn 2014). Researchers defined the key dimensions of RI and explored its normative underpinnings, mostly within the broader context of science and technology (Owen et al. 2012). Second, RI research focused on governance and policy (von Schomberg 2013), including policy instruments and regulatory frameworks that can support the promotion of RI, such as public engagement mechanisms, ethical guidelines, and sustainability criteria (Lubberink et al. 2017; Macnaghten et al. 2014; Owen et al. 2013). In the same vein, research has addressed the governance of emerging technologies such as nanotechnology, biotechnology, and artificial intelligence (Roco 2020).

A third research stream examines RI principles and how they are translated into practice across contexts. Empirical studies document routines that instantiate anticipation (e.g., foresight and impact assessment), reflexivity (e.g., structured reflection and ethics review), inclusion (e.g., stakeholder co-creation), and responsiveness (e.g., adaptive governance and redesign) in settings ranging from academic research and public sector innovation to biotechnology, healthcare, ICT, energy, and agriculture (e.g., Forsberg et al. 2017; Ceicyte and Petraite 2018; Lehoux et al. 2018; Long et al. 2020). While these studies describe what ARIR can look like, they rarely theorize how profit-driven firms integrate all four pillars systematically across the innovation lifecycle, the process-centric focus we develop as RIM in RQ1.

Finally, a recent stream of research has investigated the role of RI in how organizations respond to grand challenges. Long

and Blok (2017) argue for co-creation with diverse stakeholders in sustainable agriculture. Ambos and Tatarinov (2022) examine intrapreneurship as a path to RI capability. Liu et al. (2024) investigate how national R&D climate affects RI-oriented firms' ability to overcome innovation barriers in the circular economy. Degbey et al. (2024) study co-active engagement between customer and supplying firms in driving RI for grand challenges.

In addition, recent systematic review evidence shows that, even within business ethics and innovation management research, RI is most often discussed in terms of outcomes rather than as a process-centric innovation governance capability embedded in firms' day-to-day innovation practices (Gurzawska 2025). Despite this existing knowledge, several gaps remain, particularly in how for-profit firms understand and integrate RI in their innovation management. In addition, despite the acknowledged importance of national and cultural contexts, cross-national/cultural comparisons of RI remain scarce. This motivates our shift from viewing RI as a normative ideal to explaining variation in RIM through differences in the degree and form of ARIR integration and through the country-level antecedent role of national context and culture.

To sharpen our contribution and avoid conceptual overlap, we next delineate RI/RIM from adjacent constructs, such as sustainable/green innovation and CSR, before defining RIM and synthesizing its determinants. Sustainable/green innovation typically emphasizes environmental outcomes of products, processes, or business models (e.g., carbon and resource efficiency) and is often assessed at the output level (Boons et al. 2013). CSR focuses on a firm's broader responsibility posture (policies, reporting, philanthropy) that can sit adjacent to or outside core innovation processes (Scherer and Voegtlin 2020). RIM, however, is process-centric. It specifies how firms govern innovation activities by integrating ARIR throughout the innovation process (from concept to implementation) to balance economic and responsibility objectives. RIM thus (1) goes beyond environmental goals to include ethical and social dimensions (Voegtlin and Scherer 2017), (2) treats stakeholder inclusion as integral to innovation decision-making rather than a downstream CSR activity (Owen et al. 2013), and (3) is variance-sensitive, which means firms differ in the degree and form of ARIR integration. Building on RI, RIM addresses how firms govern innovation under tensions. We define Responsible Innovation Management (RIM) as the degree to which firms systematically integrate the four pillars of Responsible Innovation (RI) into the process of taking new ideas from their initial concept to successful implementation within an organization. RIM varies along two key dimensions. The *degree* of RIM refers to the breadth and consistency of ARIR integration across the innovation process. The *form* of RIM refers to the specific configuration of pillar emphasis and governance mechanisms through which ARIR is enacted. For instance, two firms may both integrate ARIR at a high degree, yet differ substantially in form if one prioritizes anticipation through structured foresight routines while the other emphasizes inclusion through co-creation with diverse stakeholders. This definition emphasizes variation (degree and form), process (from concept to implementation), and

paradox navigation (balancing economic with social and environmental objectives).

2.2 | Determinants of RI and RIM

The four ARIR pillars can be read as organizational responses to the core tensions in innovation. Anticipation addresses novelty vs. precaution via foresight and assessment; inclusion addresses speed vs. deliberation via structured stakeholder engagement; reflexivity addresses profit vs. stewardship via value questioning and ethical review; and responsiveness addresses planning vs. adaptation via iterative adjustment. We therefore synthesize determinants as conditions that enable these four responses within firms and across national and cultural contexts.

Prior work points to three major factors that shape how organizations view responsibility and innovation. These are regulatory regimes, national innovation foci, and cultural values (Macnaghten et al. 2014; Liu et al. 2024; Jackson 2001; Shafer et al. 2007). In our theorization, these are antecedents to firms' ARIR integration. The external environment, consisting of regulatory frameworks and policy instruments (coercive and incentive-based) as well as external turbulence, structures anticipation and responsiveness (Owen et al. 2013; Scherer and Voegtlin 2020). The dominant national innovation focus channels attention to certain ARIR pillars; for example, the traditional Japanese innovation system emphasizes Kaizen, a process of continuous evolution and improvement toward higher quality, which primarily aligns with reflexivity. Cultural dimensions (e.g., power distance, uncertainty avoidance, long-term orientation) and value orientations (traditional vs. secular-rational) also condition inclusion, anticipation, and responsiveness (Hofstede 2001; Inglehart et al. 2000; Taylor and Wilson 2012).

The literature identifies specific conditions that enable ARIR. *Anticipation* is supported by structured foresight and impact assessment (Owen et al. 2013; Lubberink et al. 2017). *Reflexivity* is strengthened by ethics routines and purpose-oriented strategy (Voegtlin and Scherer 2017; Long and Blok 2017). *Inclusion* is driven by formalized stakeholder participation and open-innovation interfaces (Chesbrough 2003; West and Bogers 2014; Lehoux et al. 2018). *Responsiveness* is enabled by adaptive innovation management that ties learning to course corrections (Shankar and Spanjol 2005; Stilgoe et al. 2013). We treat national culture and the dominant innovation focus as upstream antecedents that shape the degree and form of these within-firm conditions and, consequently, the extent of ARIR integration (RIM).

3 | Methodology

3.1 | Grounded Theory Research Approach

We adopt a Grounded Theory (GT) approach to inductively theorize how profit-driven firms integrate the ARIR principles into responsible innovation management (RIM) and how national context and culture shape the degree of RIM. GT is appropriate

for under-specified phenomena and process questions and supports constant comparison across cases and contexts (Corbin and Strauss 2008; Gioia et al. 2013). Our unit of analysis is at the firm level (the firm's innovation management process), and managers act as knowledgeable informants about organizational practices. Data collection and analysis proceeded iteratively through constant comparison within and across countries to surface convergent and divergent patterns relevant to the degree and form of ARIR integration and RIM, as well as the national and cultural antecedents.

In keeping with GT best practices (e.g., Degbey et al. 2024), we started with open, informant-centric coding to surface first-order concepts, then moved to second-order constructs and aggregate dimensions that express researcher-centric theoretical structure (Gioia et al. 2013). We treated the ARIR pillars as sensitizing concepts,¹ as guiding interpretive lenses rather than fixed coding categories or templates to be proven, using them only to tag episodes where informants described anticipation, reflexivity, inclusion, or responsiveness in innovation management. Our inductive coding generated the practices and conditions around those episodes. We then compared patterns across Germany, India, and Japan to address culture and the national dominant innovation focus as antecedents of RIM.

3.2 | Participants and Data Collection

We conducted 60 in-depth, semi-structured, open-ended interviews with innovation managers and top-level decision makers in Germany, India, and Japan (20 interviews per country; see Table 1). Given our firm-level unit of analysis (RIM as part of firms' innovation management), we purposively sampled informants in large, multinational firms (≥ 500 employees; with operations in at least one foreign market) who could validly report on how their organizations integrate the ARIR principles into innovation processes. We sought heterogeneity across country context, industry, and firm ownership to enable within- and cross-country comparisons (RQ1) and to examine national context and cultural dimensions as antecedents of RIM (RQ2).

We approached new contacts multiple times to establish rapport and trust and to reiterate confidentiality, anonymity, and transparency expectations (Gioia et al. 2013). We recruited participants through the authors' professional networks, LinkedIn outreach, and direct calls. Although not all interviewees were familiar with the term 'responsible innovation,' they were able to discuss responsibility in innovation based on their initial understanding; we then provided a shared definition grounded in von Schomberg (2013) and Stilgoe et al. (2013) to ensure conceptual alignment across interviews. Overall, our participants represent diverse industries and firm sizes, strengthening transferability of the emergent insights.

We conducted interviews from November 2023 to May 2024 using a semi-structured guide covering the firm's attitude toward responsibility, innovation practices, and managers' understanding of RIM. Following qualitative best practices (Shah and Corley 2006; Gioia et al. 2013), we iteratively refined probes and added follow-up questions as analysis progressed to clarify emergent themes and ensure cross-country comparability.

Our semi-structured framework allowed for supplementary inquiries and probing based on the respondent's statements (Shah and Corley 2006). Aligned with prior research (e.g., Gemser et al. 2024), this allowed us to select participants in a non-random fashion based on their deep knowledge of their firm's innovation activities and their potential and willingness to provide rich, relevant, diverse insights into innovation and RI practices within their firms (Corbin and Strauss 2008).

The authors conducted all interviews one-on-one, online, and recorded them with the permission of the interviewees. The first, second, and third authors conducted the interviews in Germany with an average interview length of 52 min. The interview language was English or German according to the interviewee's preference. The second and sixth authors conducted the interviews in India, in English, with an average interview duration of 50 min. The fourth author conducted the interviews in Japan, in Japanese, with an average interview duration of 49 min. Because our data spanned German, English, and Japanese interviews, we took several steps to preserve meaning across languages. Most interviews in Germany and India were conducted in English. For transcription, AI-assisted tools (TurboScribe and Notta) were used to generate initial drafts from audio recordings. Where translation was required, DeepL was used to produce a first-pass translation. In both cases, all outputs were checked against the original-language recording or transcript by an author proficient in the respective language and revised where needed to ensure conceptual equivalence rather than literal word-for-word conversion. In the Japanese data, the transcript was first refined in Japanese by restoring omitted subjects where necessary, then translated into English, and verified through back-translation into Japanese. We retained culturally and institutionally specific terms where a literal English replacement would have diluted contextual meaning. Examples include Lieferkettengesetz (the German Supply Chain Due Diligence Act) in Germany (G11), Jugaad as an innovation philosophy in India (I10), and Japanese references to an AI "charter of ethics" (J02) and coordination with local governments. We interpreted such terms in relation to the surrounding passage and organizational context during coding. These procedures helped preserve interpretive validity across languages and ensure that culturally embedded meanings were accurately carried into the English-language analysis.

3.3 | Data Analysis

We analyzed the data at the firm level using the three phases recommended in the Gioia procedure, namely first-order concepts, second-order constructs, and aggregate dimensions (Gioia et al. 2013). The second, third, fourth, and fifth authors analyzed the qualitative data from the interviews using MAXQDA. In the first phase, after deep immersion in the empirical data through detailed reading, we applied an inductive open coding to identify statements that helped us in building first-order concepts. Specifically, each co-author carefully read the material and coded transcripts line-by-line independently to surface informant-centric practices, routines, decision points, and conditions related to innovation management. In parallel, we used four template tags (anticipation, reflexivity, inclusion, and responsiveness) with explicit coding rules and anchor examples to locate episodes of RIM in each

TABLE 1 | Overview of participant and firm characteristics.

Code	Participant title	Industry (based on 2022 NAICS ^a)	Duration (min)	Ownership structure
G01	Head of Innovation	Chemical Manufacturing	58	Public
G02	Product Manager	Machinery Manufacturing	74	Private (family)
G03	Head of Corporate Development	Machinery Manufacturing	56	Private
G04	Head of Research and Innovation	Machinery Manufacturing	55	Private
G05	Head of Innovation, Product Management	Nonmetallic Mineral Product Manufacturing	54	Public
G06	Head of Innovation	Computer and Electronic Product Manufacturing	56	Public
G07	Group Innovation Manager	Machinery Manufacturing	51	Public
G08	Head of Corporate Technology	Machinery Manufacturing	58	Private (family)
G09	Innovation Manager	Computer and Electronic Product Manufacturing	47	Private (family)
G10	Innovation Manager	Transportation Equipment Manufacturing	45	Public
G11	Chief International Growth Officer	Electrical Equipment, Appliance, and Component Manufacturing	53	Private
G12	Senior Innovation Manager	Utilities	43	Public
G13	Director Environmental Innovation	Merchant Wholesalers, Durable Goods	56	Public
G14	Head of SAM Strategy	Transportation Equipment Manufacturing	47	Public
G15	Advisor Strategy and Innovation	Air Transportation	44	Public
G16	Head of Innovation	Transportation Equipment Manufacturing	46	Public
G17	Business Manager	Transportation Equipment Manufacturing	47	Private
G18	Global Director Innovation	Food Manufacturing	52	Private (family)
G19	Head of Technology and Trend Scouting	Fabricated Metal Product Manufacturing	46	Private (family)
G20	Head of Technology and Innovation	Computer and Electronic Product Manufacturing	45	Public
I01	Senior Director	Professional, Scientific, and Technical Services	44	Private
I02	General Manager Sales	Transportation Equipment Manufacturing	54	Private
I03	Director	Professional, Scientific, and Technical Services	45	Private
I04	Associate Director	Professional, Scientific, and Technical Services	48	Private
I05	Chief of Human Resources	Professional, Scientific, and Technical Services	64	Private
I06	Founder and Executive Director	Machinery Manufacturing	49	Private
I07	General Manager Production	Chemical Manufacturing	54	Public

(Continues)

TABLE 1 | (Continued)

Code	Participant title	Industry (based on 2022 NAICS^a)	Duration (min)	Ownership structure
I08	Senior Vice President	Electrical Equipment, Appliance, and Component Manufacturing	57	Public
I09	Deputy General Manager	Support Activities for Transportation	35	Private
I10	Senior Manager	Professional, Scientific, and Technical Services	54	Private
I11	Enterprise Architect	Professional, Scientific, and Technical Services	52	Public
I12	General Manager Engineering	Transportation Equipment Manufacturing	39	Private
I13	Principal Architect	Telecommunications	49	Private
I14	Assistant General Manager	Transportation Equipment Manufacturing	35	Public
I15	Chief of Productivity Division	Primary Metal Manufacturing	50	Public
I16	Deputy General Manager and Head	Transportation Equipment Manufacturing	70	Public
I17	Senior Vice President and Global Head	Chemical Manufacturing	71	Private
I18	Chief Technology Officer	Transportation Equipment Manufacturing	31	Public
I19	Section Head and Technical Director	Electrical Equipment, Appliance, and Component Manufacturing	52	Private
I20	Deputy General Manager	Transportation Equipment Manufacturing	56	Public
J01	Senior Manager	Computer and Electronic Product Manufacturing	51	Private
J02	General Manager	Professional, Scientific, and Technical Services	55	Public
J03	Executive Officer	Machinery Manufacturing	50	Public
J04	Director	Transportation Equipment Manufacturing	50	Public
J05	Director	Computer and Electronic Product Manufacturing	56	Public
J06	Senior Manager	Computer and Electronic Product Manufacturing	30	Public
J07	Director	Computer and Electronic Product Manufacturing	46	Public
J08	Director	Chemical Manufacturing	56	Private (family)
J09	Director	Food Manufacturing	38	Public
J10	Director	Chemical Manufacturing	40	Public
J11	Director	Chemical Manufacturing	47	Private
J12	Director	Transportation Equipment Manufacturing	58	Public

(Continues)

TABLE 1 | (Continued)

Code	Participant title	Industry (based on 2022 NAICS ^a)	Duration (min)	Ownership structure
J13	Director	Computer and Electronic Product Manufacturing	53	Public
J14	Director	Beverage and Tobacco Product Manufacturing	34	Public
J15	Director	Chemical Manufacturing	51	Public
J16	Director	Computer and Electronic Product Manufacturing	50	Public
J17	Executive Officer	Chemical Manufacturing	60	Public
J18	Manager	Fabricated Metal Product Manufacturing	40	Public
J19	Director	Utilities	60	Public
J20	Executive Officer	Chemical Manufacturing	60	Public

Note: G = Germany, I = India, J = Japan.

^a2022 NAICS (North American Industry Classification System).

transcript. These tags did not originate inductively; rather, they map how the data instantiate RIM within firms, consistent with GT's use of sensitizing concepts, as flexible interpretive guides (Corbin and Strauss 2008). In the second phase, through constant comparison and joint adjudication, we clustered first-order concepts into second-order constructs. In the second-order analysis, we moved from an inductive to an abductive research process and iteratively compared the emerging themes with the relevant literature and existing theories and considered them together (Gioia et al. 2013). In the third phase, we aggregated the second-order constructs into six aggregate dimensions (Gioia et al. 2013). These are (1) Cultural dimensions and values, (2) Pillars of responsible innovation (anticipation, reflexivity, inclusion, responsiveness), (3) Tension management between economic and responsibility objectives, (4) National dominant innovation focus, (5) External environment, and (6) Top management's RI advocacy (see Figure 1).

Based on the identified first-order concepts, second-order constructs, and the aggregate dimensions, our author team developed a data structure that visualizes the analysis procedure from the raw data to the resulting themes (Gioia et al. 2013). We discuss the data structure in the following section, including power quotes that best illustrate the text that precedes them. Based on the data structure, we developed a conceptual model that visualizes the proposed relationships between emerging dimensions (Gioia et al. 2013). We monitored saturation (Guest et al. 2020) and used intercoder discussions and triangulation, participant checks, and an audit trail to enhance the rigor and trustworthiness of our analysis.

3.4 | Rigor Criteria and Trustworthiness Measures in Our Data Analysis

We assessed rigor and trustworthiness following Lincoln and Guba's (1985) criteria (credibility, transferability, dependability,

and confirmability) and Gioia et al.'s (2013) guidance for transparent inductive theorizing and traceability from raw data to aggregate dimensions (first-order concepts, second-order constructs, aggregate dimensions). The measures below summarize how each criterion was addressed in our cross-national qualitative design.

Credibility refers to the plausibility and empirical grounding of the claims. We enhanced credibility through (1) contextual triangulation of perspectives across three national settings (Germany, India, Japan), industries, and organizational roles (innovation managers and top-level decision makers); (2) constant comparison across interviews and countries during analysis; (3) independent coding by multiple authors followed by structured reconciliation discussions; and (4) member checks with a subset of informants (27 follow-ups; nine per country) to validate cross-country patterns and the emerging conceptual model. We also provide a clear chain of evidence through the integrated data structure (Figure 1) and illustrative quotations in Section 4 and Online Appendix B (Gioia et al. 2013).

Transferability concerns the applicability of insights to other contexts. We support transferability by purposively sampling firms across multiple industries (technology, manufacturing, automotive, energy, consumer goods) and by providing detailed descriptions of the empirical setting and cross-national comparisons. Rather than claiming statistical generalization, we aim for theoretical transferability, enabling readers to judge whether the proposed mechanisms apply to other profit-driven firms under comparable institutional and cultural conditions (Lincoln and Guba 1985).

Dependability refers to analytical consistency over time and across researchers. We enhanced dependability through a documented coding process using a shared codebook, independent coding by multiple researchers, and iterative adjudication meetings to align interpretations and refine category definitions. These included intercoder reliability checks, where the multiple

First-order Concepts	Second-order Constructs	Aggregate Dimensions
Organizational hierarchy (India, Japan) Inclusion of multiple levels of employees (Germany) Diverse stakeholders in innovation (Germany)	Power distance	Cultural dimensions and values
Structured processes (Germany, Japan) Risk management mechanisms (Germany, Japan) Feedback loops (Germany, Japan) Evolving and ad hoc innovation approach (India)	Uncertainty avoidance	
Foresight (Germany, Japan) Reflection and learning (Germany, Japan) Proactive impact assessment (Germany, Japan) Short-term goals and quick decision-making (India)	Long-term orientation	
Deference to authority and top management (India) Traditional and established norms and systems; less adaptive processes (India) Responsive to changing societal challenges and expectations (Germany, Japan)	Traditional vs. secular-rational Values	
Regulatory foresight Anticipatory innovation governance Innovation impact assessment Technology foresight Prototyping and simulating	Anticipation	Pillars of responsible innovation
Monitoring Innovation probing Internal RI team Develop norms and standards	Reflexivity	
Open innovation Public-private partnership (PPP) Innovation ecosystem	Inclusion	
Adaptive innovation management Innovation accessibility Leveraging peer experiences	Responsiveness	
Innovation ROI Innovation profitability Number of commercialized patents/products	Financial objectives	Tension management (economic vs. responsibility objectives)
Purpose Community Innovation adaptability for increased access CSR metrics	Social and ethical objectives	
Target emission level Resource conservation Labels and certifications	Environmental objectives	
Coercive pressure Normative pressure	Regulatory framework	External environment
Perceived customer expectation Cost competitiveness	External turbulence	
Strategic anchoring of sustainability Product durability Responsible value chains Long-term customer relationships Collaboration with academia and research institutes Sustainability as a driver of innovation	Sustainable and collaborative innovation, and long-term value creation	National dominant innovation focus
Affordable and accessible solutions Cost-efficiency Resource constraint consumers	Frugal innovation, and market-driven competitiveness	
Constant improvement culture Risk reduction and mitigation in innovation processes Focus on quality and quality assurance	Continuous improvement, low risk, and incremental innovation	
Top management demand for RI Top management RI advocacy	Top management RI championing	Top management's RI advocacy
RI policy Responsibility incorporated in company purpose Responsibility incorporated in company values	Organizational embedding of responsibility	

FIGURE 1 | Legend on next page.

FIGURE 1 | Data Structure: National antecedents (dominant innovation focus and cultural dimensions), ARIR pillar integration (RIM), and tension management outcomes. Solid lines indicate constructs and dimensions drawn from established theory. Dashed lines indicate constructs and dimensions that are new to this study. All first-order concepts are empirically derived from informant accounts.

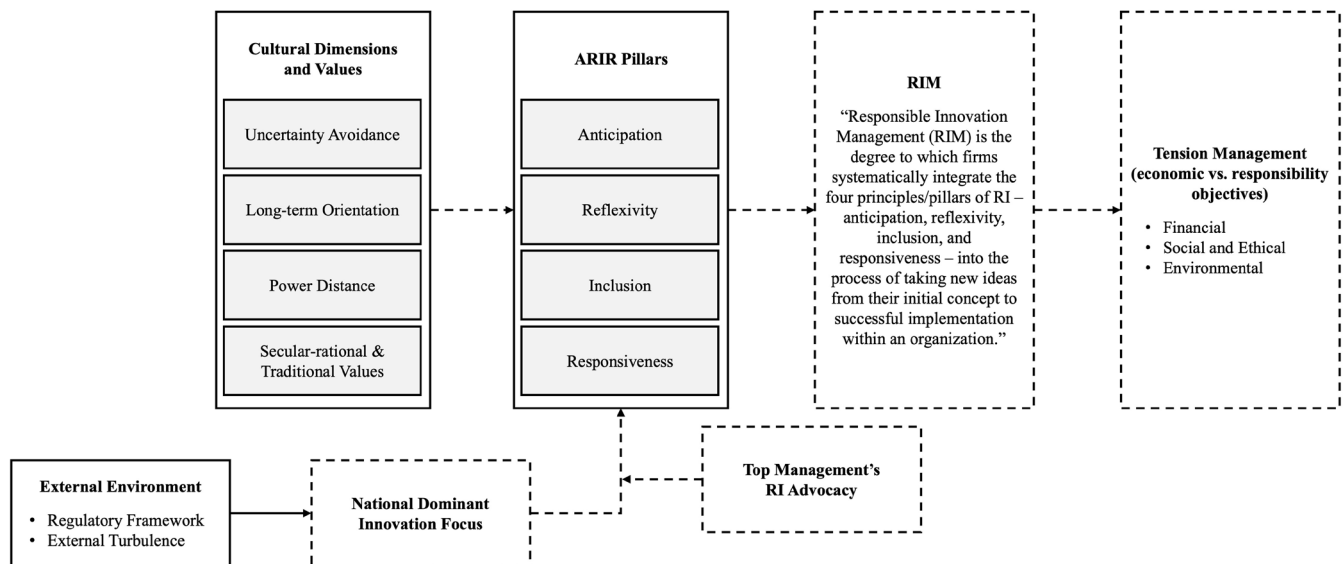


FIGURE 2 | A Conceptual Model of Responsible Innovation Management (RIM) in For-Profit Firms. Solid lines indicate constructs and relationships drawn from established theory. Dashed lines indicate constructs and relationships that are new to this study.

researchers of the author team, from Germany, France, India, and Japan, independently coded interviews and reconciled differences through discussion to arrive at a shared interpretation (Corbin and Strauss 2008). We further maintained an audit trail of coding iterations, codebook refinements, and analytic decisions (Gioia et al. 2013).

Confirmability concerns the extent to which findings are grounded in the data rather than researcher predispositions. We enhanced confirmability through an audit trail documenting coding decisions and construct definitions, participant checks to verify interpretations, and respondent quotations throughout the findings and Online Appendix B that allow readers to evaluate the linkage between raw data and conceptual claims (Gioia et al. 2013).

In addition to trustworthiness, we attended to theoretical distinctiveness (Gioia et al. 2013) through a deliberate process of comparing our emerging constructs against the existing literature at each stage of the analysis. As second-order constructs and aggregate dimensions took shape, we asked whether each construct simply relabeled an existing concept or captured something not yet theorized in the RI, innovation management, or institutional theory literatures. For example, RIM as a variable organizational capability (varying in degree and form) differs from how prior RI research has treated responsible innovation, which has predominantly been framed as a normative ideal or a set of prescriptive principles rather than as a firm-level governance process with observable variation (Owen et al. 2012; Stilgoe et al. 2013). Similarly, while institutional theory recognizes the influence of national context on organizational behavior (North 1990), the specific construct of national dominant innovation focus as an antecedent of how firms enact RI has not been theorized in prior work.

We also identified top management's RI advocacy as an amplifying condition, a construct that emerged inductively from our data and is not present in the existing RI literature as a distinct theoretical mechanism. To further verify distinctiveness, we reviewed whether our cross-national comparative design surfaced patterns that a single-country study would not have revealed. The systematic variation across Germany, India, and Japan in both the degree and form of RIM confirmed that our constructs are not artifacts of a single institutional context. In Figures 1 and 2, constructs and relationships that are new to this study are indicated with dashed lines, while those drawn from established theory are shown with solid lines. Section 5.1 articulates the full theoretical contributions of these findings. By addressing these five criteria of credibility, transferability, dependability, confirmability, and distinctiveness, our study meets the methodological standards for qualitative trustworthiness established by Lincoln and Guba (1985) and extended to inductive theory building by Gioia et al. (2013).

4 | Findings

Figure 1 summarizes our data structure and the six aggregate dimensions that emerged from our analysis, and Figure 2 presents the resulting conceptual model. In line with our research questions and model logic, we present the findings in two steps. First, addressing RQ2, Sections 4.1–4.4 theorize how national context (external environment and national dominant innovation focus) and cultural dimensions/values act as antecedents shaping firms' degree and form of RIM.

Section 4.1 shows how the external environment (e.g., regulatory frameworks and external turbulence) shapes national

innovation logics. Section 4.2 theorizes how the national dominant innovation focus conditions the enactment of the four ARIR pillars. Section 4.3 identifies top management's RI advocacy as an enabling condition that moderates this relationship by amplifying ARIR enactment even when national innovation logics are less aligned with RI. Section 4.4 details how cultural dimensions and values shape which ARIR pillars are emphasized and how they are implemented. Second, addressing RQ1, Section 4.5 synthesizes how firms' systematic integration of the ARIR principles enables tension management outcomes across financial, social/ethical, and environmental objectives.

4.1 | External Environment as an Antecedent of National Dominant Innovation Focus

Our findings show that the external environment shapes the national dominant innovation focus. Institutional and economic pressure can influence which innovation logics become dominant within a country. This leads to more sustainable and collaborative innovation and long-term value creation in Germany, frugal innovation and market-driven competitiveness in India, and continuous improvement, low-risk, and incremental innovation in Japan. The national dominant innovation focus on sustainable and collaborative innovation and long-term value creation, for instance, partially builds upon responsible value chains.

In the *German* context, the external environment, particularly regulatory frameworks, contributes to the institutionalization of responsible value chains. "There is a regulation which is called 'Lieferkettengesetz' ['German Supply Chain Act'] and that defines what kind of safety measures you need, source components from different parts of the earth, and from whom you can source it, or for whom you can't source it" (G11).

For the national dominant innovation focus in *India* on frugal innovation and market-driven competitiveness, we captured intense cost pressure and price-based competition as key elements of the external environment. "We are in a very competitive field. [...] We need to make sure we are on top of the innovation chain so that we can provide the most value to the customer" (I13) and "Indian customers will never value this. You know. They always want the solution with the cheapest cost, whereas international customers, it's always value they want." (I04).

In *Japan*, informants emphasized external turbulence as a salient environmental pressure, especially shifting customer expectations and global regulatory developments, which reinforce risk-averse, incremental innovation logics. "If we don't do this, it will be the end of our business if our customers don't buy our products. I am afraid that we have to keep an eye on global regulations and movements" (J07).

4.2 | National Dominant Innovation Focus as an Antecedent to RIM

We find the following systematic, country-level dominant innovation foci that shape how ARIR is enacted. In Germany, the focus lies on sustainable and collaborative innovation,

structured innovation management, as well as regulated and long-term value creation, while India relies on frugal (Jugaad) and cost-effective innovation, market-driven competitiveness, as well as service and entrepreneurial innovation, whereas Japan focuses on continuous improvement (Kaizen), low risk, high quality, and precision, with close industry-government ties (Keiretsu model). We conceptualize these dominant innovation foci as broader nationally prevalent innovation logics, not as RI orientations per se, that condition which ARIR mechanisms become emphasized (or deprioritized) in firm-level innovation management. We therefore articulate these as propositions P1–P3 and support each with power quotes below.

P1. The dominant innovation focus in Germany leads to encouraging levels of alignment on anticipation, reflexivity, inclusion, and responsiveness in firms.

Our data illustrate this alignment across all four pillars. On *anticipation*, "Particularly in the concept phase [...] there is a tool that focuses on what impact the product will have if we develop it now, i.e., impact in the sense of social, sustainable, disposal, all that sort of things" (G05). On *reflexivity*, "We do safety systems. [...] Brakes are hydraulic brakes and there's hydraulic fracturing fluid. It's not the most dangerous substance, but it's for sure not good if it comes to the environment. We are working on a dry break to completely get rid of brake fluid. That we are doing because we look at the impact of our product and see how we can make them more sustainable, but also reduce waste" (G14). On *inclusion*, "So we involve all stakeholders. We make sure to do the right thing and that we have the customers and stakeholders in mind. [...] We involve customers, suppliers [...] We naturally have an eye on what society does. We work closely with institutions such as universities" (G06). On *responsiveness*, "Whenever possible, we try to make our products free of solvents, free of things like these fluoroorganic compounds, these forever chemicals, responding to what's being discussed a lot now" (G01).

In contrast to the German context, we find weak to no alignment with these pillars in India.

P2. The dominant innovation focus in India leads to weak alignment with the ARIR pillars.

Across many Indian firms, strategic orientation primarily emphasizes growth, quality, and cost consciousness. Responsibility objectives are less frequently articulated as explicit strategic priorities. Correspondingly, ARIR is often framed in operational terms (e.g., responsiveness, speed, and competitiveness) rather than as a responsibility-oriented governance logic.

"Strategy is more of planning and successful growth of an organization. [...] We need to be very responsive to customers and competition, because if the customers have to accept any innovative solution, we need to be ahead of the competition" (I05) and "the core value which we want to propose to the customer is a low cost, reliable product. We are a very cost-conscious company" (I02).

Nevertheless, our findings uncovered an enabling factor that enhances the integration of ARIR in innovation management, and thus RIM. We address this boundary condition, top

management's RI advocacy, in the next sub-Section 4.3. In Japan, the degree of ARIR integration is substantially greater than in India, though the form of RIM differs from the German pattern. Japanese firms' pillar emphasis concentrates on anticipation, reflexivity, and inclusion, while the governance routines supporting responsiveness are less developed.

P3. The dominant innovation focus in Japan leads to a form of RIM that emphasizes anticipation, reflexivity, and inclusion, with responsiveness present but less developed as a proactive governance routine.

Japanese firms illustrate this configuration across the pillars. On *anticipation*, "When we think about the future of Japan, the increasing cost of medical care is also a bad thing. One solution is to prevent diabetes from occurring in the first place. What came to mind when I thought about what should be done to prevent diabetes was to develop a sweetener that would replace the excessive use of sugar" (J08). On *reflexivity*, "The question of how to deal with innovation, or how to deal with things like artificial meat, has not yet been answered. We are constantly questioning and working on it" (J09). On *inclusion*, "Co-creation with stakeholders. From the perspective of customers and suppliers, such as universities and governments, I have the impression that this kind of thing is becoming more and more common these days. [...] We are also involved in a co-creation project with a major retailer, where we are working together to create new value and a new brand. Our goal is to make our products more useful to consumers on a global scale" (J10). *Responsiveness* is present but tends to be reactive rather than proactive. As one informant described, "When a problem arises later, we look back to see what was missing and add more mechanisms to address the missing parts. However, this takes time. [...] We are already using refrigerants that contain chlorine, which destroys the ozone layer, so basically, they are greenhouse gases now. We are responding to recover the refrigerant and reuse it because it would cause global warming" (J03).

4.3 | Top Management's RI Advocacy as a Moderator

As discussed in the preceding section, the national dominant innovation focus shapes how ARIR is enacted in for-profit firms. Our findings identify top management's RI advocacy as a moderator, which influences the relationship between national dominant innovation focus and ARIR enactment by legitimizing, resourcing, and prioritizing responsibility-oriented governance routines. Even when the national dominant innovation focus does not lead to alignment with the RIM pillars, firms where top management **champions** RI and/or where responsibility is **embedded** in organizational policies and values nonetheless achieve alignment with the ARIR pillars.

This is visible across all four pillars in the Indian context, where the moderating effect is most pronounced. On *anticipation*, "There is a responsible innovation in [my company], and now there is a responsible AI that evaluates the AI innovation [...] Let's say we train AI with certain samples, [...] just say you train only with the male participants, it may not properly recognize, say, females. So, we need to make sure that when we train these

models, we train with people with a diverse background" (I13). On *reflexivity*, "But especially reflexivity and inclusion we are not doing, except when top management demands it ... maybe there is a lot more scope for us to improve on that side" (I05). On *inclusion*, "If you follow our CEO [...], they are talking about responsible innovation almost for the last two years, three years. They support it. [...] We say business earlier was like making business to make money. That was your biggest objective. But it has evolved. You're doing business for your customer, you're doing something good for customers now, together with them" (I04). On *responsiveness*, "There are four basic building blocks from our top leadership. These four are meant to be the pillars for all of us and care is about people and what we do as an organization." When it comes to innovation, "there are some metals which should not be used because it's harmful for human beings" (I08).

While leadership advocacy is visible across countries, it is especially consequential in contexts where the dominant innovation focus does not, by itself, prioritize responsibility objectives. In such settings (most notably in India in our data), top management sponsorship and the strategic anchoring of responsibility in corporate purpose, values, and policies can meaningfully amplify the enactment of individual ARIR pillars within innovation management. As informants across all three countries confirmed, "A general awareness and sense of duty for sustainability in every respect, I think that is culturally ingrained in us" (G06). "Our company has been in business for more than 100 years, and since its foundation, the founder has always talked about the importance of connecting with society" (J09). "Driver of responsibility, I think, is top management focus, time and again, the leadership" (I03).

4.4 | Cultural Dimensions and Values as an Antecedent to RIM

Beyond a national dominant innovation focus, cultural dimensions, such as power distance, uncertainty avoidance, and long-term orientation (Hofstede 2001), as well as secular-rational vs. traditional values (Inglehart et al. 2000), shape which ARIR pillars are emphasized. We formulate propositions P4–P7 to articulate our findings and juxtapose contrasting quotes to illustrate the underlying mechanisms. These mechanisms also became visible in concrete organizational decision episodes. In Germany, low power distance was reflected in how firms structured stakeholder input into innovation processes. One informant described including customers from the earliest stages of development as standard practice, explaining that "this is a classic example of how we manage to achieve the objectives of our projects more precisely by integrating customer interviews and customer opinions or even a prototype as early as possible" (G05). In India, by contrast, high power distance was evident in how senior management acted as a gatekeeping function over innovation direction. One informant described being supportive of ideas generated by teams, but explained that at the senior level "our responsibility also becomes we are the Blackcat. And we anticipate the problems [...] to make sure that they are aware of the plausible challenges" (I04). The decision about which ideas to pursue was ultimately concentrated at the top, illustrating how hierarchical authority constrains the breadth of inclusion in

innovation. In Japan, high uncertainty avoidance and long-term orientation became visible in how firms structured innovation decisions. One informant described the practice of discussing with each stakeholder in detail, “what is acceptable and what is not and which party should take responsibility” before commercializing a project (J01). Another firm sustained a product development effort in the red for more than ten years because “the management saw that we would be needed in the future” (J06). These episodes make the proposed mechanisms more observable by showing how cultural dimensions shape specific decision routines, escalation paths, and investment horizons within firms. Our analysis further reveals that Germany (low power distance) shows high levels of inclusion, whereas India (high power distance) shows low levels of inclusion.

P4. Low power distance enhances inclusion in RIM.

Germany: “One of the core values of innovation is to be transparent and open, because only if you show the stuff you are doing, you can get feedback. You can integrate feedback from people, and you can get an idea how people react to that what you’re doing. [...] You are also integrating people early on and you get them onboarded” (G13). By contrast, in *India*, “For new product development, we get inputs from a couple of levers. One is government regulations. [...] The second lever is the global market trend. [...] The third lever is benchmark, where my competition is going. Fourth lever is my senior management direction [...] even if I wish to go into electric vehicles, but if my senior management doesn’t want that, we can’t do it” (I12).

Our analysis further indicates that high uncertainty avoidance (Germany, Japan) is associated with a stronger emphasis on anticipation, whereas low uncertainty avoidance (India) is associated with a weaker emphasis.

P5. High uncertainty avoidance enhances anticipation in RIM.

Germany: “And with large potential customers, they make sure that an investment project—and as a rule, the end of an innovation project is always associated with an investment—that the risk is taken out, at least in part” (G01). In *India*, “We would all like to have more certainty on things, which we then try to do something about. But usually, there will be many unknown or risk factors, and we move forward. That is a challenge” (I10). In *Japan*, “I have been concerned about the extent to which we are allowed to use artificial ingredients, which should be allowed by the government, but we try to avoid them. It is a very big theme that deals with things like salt and sugar, which can affect the body” (J09).

Similarly, high long-term orientation (Germany, Japan) is associated with a stronger emphasis on anticipation and reflexivity, whereas medium long-term orientation (India) is associated with a weaker emphasis.

P6. Higher long-term orientation enhances anticipation and reflexivity in RIM.

Germany: “We want to be profitable, but we want to achieve growth in a way that we also improve our sustainability quite

massively, by reducing our CO2 emissions. [...] We transition from old and less efficient processes to biotechnological ones. We want to grow where sustainability is in demand” (G01). In *Japan*, “A few years ago, it became clear that if you were not conscious of environmental performance, you would not be able to survive in the market. The recent AI boom is a good example, as devices are used to run AI, they consume enormous amounts of power” (J02). In *India*, “We still look at small innovation to differentiate from competition. We are a solutions company. We are not looking at large scale, long-term innovation. We focus on small innovations that provide differentiation in the current services or current activities” (I11).

Our analysis also uncovered differences along the dimension of traditional vs. secular-rational values. Germany and Japan, both characterized by secular-rational values, exhibit stronger emphasis on anticipation and responsiveness, whereas India, characterized by traditional values, shows weaker emphasis.

P7. Secular-rational values enhance anticipation and responsiveness in RIM compared to traditional values.

Germany: “We are very proud of our products that have been developed and optimized over the years, based on science. This is our DNA, regardless of which product line [...] they have all been developed by us, based on science. There is a wealth of research and studies done in both the university as well as the field to support and to demonstrate that the products are effective, efficacious, and safe of course” (G18). In *Japan*, “I felt a strong sense of social responsibility in this company. When we screened our business, there would be almost no products in our area of use. That’s why I told them that they had to start doing something, even if it is small. It was a proposal in response to the changes in society and our responsibility” (J09). In *India*, “our innovations are incremental in nature” (I15).

Overall, we find strong evidence that cultural dimensions and values shape which ARIR pillars are emphasized and how they are implemented, thereby influencing both the degree and the form of RIM across national contexts. At the same time, we observed deviant cases within each country that do not fully conform to the dominant national patterns. These cases suggest that the country-level patterns identified above should be interpreted as dominant tendencies rather than uniform profiles and that firm-level and industry-level conditions can produce meaningful departures from these tendencies.

In *Japan*, although proactive responsiveness routines were generally less developed than those supporting the other three pillars, some firms described strong responsive action. One informant from the chemical manufacturing industry, which has a significant environmental footprint, explained that “we have to replace what is already in the products, so we are now working on various initiatives. One of them is to develop and design our own new technologies, mainly in the Development Division. We are trying to develop materials that do not contain fluorine, and we are using AI and other methods to develop new structures with the same performance and low environmental impact. We can’t do it alone, so we are working together with universities, research institutes, companies, and computer science experts” (J15). This suggests

that industry-specific environmental exposure can activate responsiveness even when the broader national innovation orientation favors stability, incremental improvement, and risk avoidance. The mechanism is consistent with our theorization of the external environment (Section 4.1), where regulatory frameworks and external turbulence shape innovation logics. In these cases, the environmental salience of the industry appears to operate as a firm-level trigger that overrides the national-level pattern.

In Germany, where ARIR alignment was generally broad, one firm reported a notable exception. The informant explained that “due to the company’s economic situation, the focus is more on the biggest levers,” shifting attention back to growth and profitability, leaving broader societal concerns “out of the picture” and limiting the integration of RIM. As the informant concluded, “that’s why the company is still far away from the topic of the fourth pillar” (G03). This case illustrates that even in a national context where institutional conditions support broad ARIR integration, short-term financial pressure at the firm level can constrain the degree of RIM. The mechanism directly reflects the economic-responsibility tension at the core of our model. When economic pressures become acute, firms may selectively narrow their pillar emphasis toward those most directly tied to regulatory compliance or market positioning, while deprioritizing broader societal inclusion or responsiveness.

In India, the pattern was more heterogeneous than in Germany or Japan, with greater variation across firms in the degree and form of ARIR integration. While the dominant national innovation orientation of frugal, market-driven competitiveness was associated with more selective pillar alignment, several firms departed from this pattern. One informant argued that “Inclusion will definitely bring advantages because you have a different perspective, you identify issues much earlier, and get a perspective on the entire effectiveness of the solution, so that can definitely help to give adequate consideration to different aspects” (I13). Another stressed that “all four pillars are important. Without these four vectors, you cannot move innovation ahead” (I14). These departures are consistent with the moderating role of top management’s RI advocacy theorized in Section 4.3. I13, for instance, is the same firm whose top management championed responsible AI practices and institutionalized RI evaluation processes within the organization (see Section 4.3). I14, a public transportation equipment manufacturer with global operations, international supply chain norms and partner expectations create additional pressure toward ARIR integration beyond what the domestic innovation orientation alone would produce. In both cases, firm-level leadership commitment and global market exposure appear to amplify ARIR enactment in ways that override the constraints of the national context.

These deviant cases confirm that the national-level antecedents we theorize (dominant innovation focus, cultural dimensions) operate as probabilistic shapers of RIM, not as deterministic constraints. Firm-level conditions, particularly top management advocacy, industry-specific environmental exposure, and global market integration, can push individual firms toward higher or lower degrees of ARIR integration than the national pattern would predict. Future research could examine these firm-level

moderators more systematically to identify boundary conditions of the national-level relationships proposed in our model.

4.5 | Tension Management Outcomes (Economic vs. Responsibility Objectives)

We now examine the outcomes of RIM, specifically how firms enact RIM to manage tensions between economic goals and social-environmental responsibility. Our analysis reveals that RIM enables firms to balance tensions across financial, social/ethical, and environmental objectives by helping them with the transition toward sustainability-oriented products, services, and business models. Firms try to overcome potential tensions between economic and responsibility goals through sustainable solutions. “The aim now is to achieve both of these targets, which are contradictory from a current perspective, i.e., to achieve growth while reducing our footprint at the same time. And how do we want to realize this? On the one hand, to decarbonize our production [...] and at the same time to create a switch from petrochemical-based to sustainable, renewable, bio-based raw materials and also to change our technologies” (G01).

Anticipation supports firms in identifying and integrating sustainability considerations early, by systematically scanning emerging regulatory, technological, and societal developments and reflecting them in upstream innovation choices. “In the area of legislation or NGOs, we have very much taken this reuse aspect into consideration [...] which was never such a focus for a traditional manufacturing company like us. But it gets to the question of whether we will still be a manufacturing company in 20 years’ time? [...] So changed requirements that make it very important to integrate the environment at an early stage” (G05).

Reflexivity can help firms to monitor the sustainability impact of their innovation projects. “We know that the innovation projects that we have in our portfolio now contribute positively to one KPI that we started to track toward the environment. That is something we are measuring and know that our projects actually contribute to avoiding emissions” (G12).

Inclusion can support firms in developing and implementing sustainability-oriented solutions by integrating stakeholder perspectives early enough to reshape design assumptions and adoption pathways. “We are now entering the PV business in the roof segment. And at the beginning of this project, we assumed that we would introduce a module and be successful with it. Various in-depth interviews then showed that all the different customer groups actually said that giving them a module would be of relatively little use, because they actually only work with complete systems. [...] And accordingly, it is actually fundamental for us to integrate these basic voices at an early stage” (G05).

Responsiveness can support firms in adapting innovation trajectories when new environmental or social concerns emerge, including redesigning processes and reallocating effort toward lower-impact solutions. “One of the things we have been promoting most strongly with regard to biodiversity is that we are developing specific products that reduce the negative impact of our products on organisms. [...] There is often a process to dye patterns on T-shirts and other items, but the amount of

water used in the normal dyeing process is extremely large. Moreover, the water used after the dyes is extremely environmentally destructive. [...] Therefore, by taking a scalpel to the dyeing process itself, the amount of water used can be reduced overwhelmingly, and emissions can naturally be very low" (J07).

In summary, RIM, the systematic integration of ARIR across the innovation process, enables firms to anticipate downstream impacts, reflect on trade-offs, include affected stakeholders, and adapt innovation trajectories, thereby improving tension management across financial, social/ethical, and environmental objectives. Consistent with our model, the degree and form of these tension-management outcomes depend on RIM's upstream antecedents, such as external environments, national innovation logics, cultural dimensions/values, and the enabling role of leadership advocacy.

5 | Discussion

5.1 | Theoretical Contribution

Our research contributes to RI scholarship by extending it from its traditional focus on publicly funded scientific research and policy-driven initiatives into the domain of profit-driven firms. Unlike prior RI research, which has predominantly treated responsible innovation as a normative ideal or a set of prescriptive principles (Owen et al. 2012; Stilgoe et al. 2013), we conceptualize RIM as a firm-level governance process that varies in both degree and form. This reframing has important consequences. It moves RI from a question of whether firms should be responsible to a question of how and to what extent they integrate ARIR into day-to-day innovation management under market pressures. Our cross-cultural conceptual model specifies how firms institutionalize ARIR despite the economic-responsibility paradox, answering calls for RI research in the business context (Voegtlin et al. 2022) and providing a testable foundation for future empirical work.

Second, we develop new theory on how a country's dominant innovation focus shapes firms' enactment of RIM. Prior RI research has recognized that regulatory regimes can affect RI adoption (Schroeder and Ladikas 2015), and Liu et al. (2024) show that the national R&D climate can be conducive to RI-oriented firms' patent productivity. However, no prior study has theorized how the prevailing innovation orientation of a country conditions which ARIR pillars firms prioritize and how they govern innovation accordingly. Our findings reveal that this conditioning is substantial. German firms, operating within a sustainable and collaborative innovation orientation, showed alignment with all four pillars. Indian firms, operating within a frugal, market-driven orientation, exhibited alignment primarily when top management actively championed RIM. Japanese firms, with a continuous improvement and incremental innovation orientation, exhibited a high degree of overall ARIR integration but a form of RIM in which governance emphasis fell on anticipation, reflexivity, and inclusion. Responsiveness was present but less developed as a proactive routine, tending instead toward reactive correction after problems emerged. These patterns would not have been visible in a single-country study,

and they establish national dominant innovation focus as a theoretically distinct antecedent of RIM that has not been identified in prior RI research.

Third, unlike existing RI scholarship, which has largely treated cultural context as background rather than as a theorized antecedent, we identify specific mechanisms through which cultural dimensions and values shape the form of RIM. Our findings show that power distance affects who participates in innovation decision-making. In low and medium power distance cultures (Germany, Japan), firms involve a broader range of stakeholders and multiple levels of employees in RIM. In high power distance cultures (India), key decisions are centralized and fewer stakeholders are engaged. Uncertainty avoidance and long-term orientation shape how firms approach anticipation. In Germany and Japan, where both dimensions are high, firms maintain structured processes for risk assessment and future planning that are largely absent in the Indian context. These are not simply descriptive observations. They identify the cultural conditions under which specific ARIR pillars are more or less likely to be enacted, offering a basis for context-sensitive theory building on RIM across institutional settings.

5.2 | Managerial and Policy Implications

Our findings carry practical implications for how innovation managers and policymakers can strengthen RIM in profit-driven firms. However, these implications require a different starting point than a simple pillar-by-pillar implementation guide. The central challenge our research surfaces is not whether firms should integrate ARIR into innovation management, but how they should do so when economic and responsibility goals must be pursued simultaneously (Stephan et al. 2019), and within the specific constraints imposed by their national and cultural context. As Gans et al. (2019) argue in the context of entrepreneurial strategy, actors facing paradoxical tensions cannot resolve them by optimizing across all dimensions simultaneously. Instead, they must make deliberate strategic choices about where to commit, accepting that some equally viable alternatives will be left behind. We see a direct parallel in RIM. Managers cannot simply adopt all four pillars at maximum intensity as a universal best practice. The form of RIM that is feasible and effective in one national context may be poorly suited to another. Our findings point to three practical principles for addressing this challenge.

First, diagnose before designing. Similar to how Kumar et al. (2025) identify ethical blind spots in Design Thinking and offer practices to mitigate them, our degree/form framework offers managers a diagnostic tool for assessing where their firm's RIM configuration has gaps and where strategic investment is most needed. The first step is to map the firm's current RIM configuration. Which pillars are already well supported by existing governance routines, and which are underdeveloped? Our findings suggest that these gaps are not random. They are systematically shaped by national innovation focus and cultural dimensions. German firms, for instance, showed broad pillar integration but some evidence of retreat under economic pressure, suggesting that the critical managerial task in that context is sustaining RIM commitment when financial conditions tighten.

Indian firms showed greater heterogeneity, with alignment depending heavily on top management advocacy. For managers in contexts resembling the Indian pattern, the highest-impact investment is in building leadership commitment and embedding responsibility into organizational purpose, goals, and policies. Japanese firms showed strong governance routines for anticipation, reflexivity, and inclusion but less developed routines for proactive responsiveness. For managers in that context, the strategic priority is designing mechanisms that enable course correction when new societal or environmental concerns emerge during an ongoing innovation process, rather than only after problems surface.

Second, work within cultural constraints rather than against them. A common temptation is to adopt RIM practices from contexts where they appear to work well. Our findings caution against this. The same practice can function differently depending on the cultural environment. Broad, open stakeholder participation (a hallmark of inclusion in low power distance contexts like Germany) may not transfer effectively to high power distance settings. In such settings, managers can achieve meaningful inclusion through structured interfaces (such as formal advisory panels, staged stakeholder consultation, or designated liaison roles) that are compatible with hierarchical decision-making. Similarly, in cultures with low uncertainty avoidance, formalizing anticipation through rigid foresight protocols may create resistance. Instead, managers can embed anticipation into existing planning rhythms (such as market scanning or competitive benchmarking cycles) rather than introducing entirely new governance structures. The practical principle is to design ARIR routines that fit the cultural grain of the organization rather than importing practices that assume a different institutional environment.

Third, adopt staged commitment to resolve the economic-responsibility tension. Gans et al. (2019) show that under deep uncertainty, actors benefit from testing strategic alternatives on a limited scale before making full commitments, because experimentation generates learning that pure analysis cannot provide. We see a direct application to RIM. Many managers in our interviews perceived a tension between investing in responsibility-oriented governance and maintaining speed, cost discipline, and competitive positioning. Staged commitment offers a resolution. Rather than implementing a comprehensive RIM overhaul, managers can pilot specific ARIR routines (e.g., a structured foresight review in one product line, or a stakeholder co-creation initiative for a single innovation project) and evaluate whether the routine generates value in their specific operating context before scaling it across the organization. This approach reduces the perceived risk of RIM and generates internal evidence that can build organizational buy-in. It also aligns with the logic of our findings on top management advocacy. When managers can demonstrate that a specific ARIR routine contributes to innovation outcomes, the case for broader integration becomes concrete rather than aspirational.

For policy implications, our cross-country evidence indicates that the external environment (regulatory frameworks, standards, incentives) plays a significant role in shaping the national innovation logics that condition RIM. Policymakers who wish to strengthen responsible innovation in their economies should

recognize that regulation and standards function not only as compliance requirements but as signals that legitimate and normalize responsibility-oriented governance within firms. In our interviews, informants across all three countries indicated that clear regulatory expectations were among the most effective triggers for institutionalizing ARIR routines. Beyond regulation, governments can support RIM by co-creating industry standards with firms, offering grant programs tied to responsibility criteria in innovation, and reducing external turbulence through stable and predictable policy environments. Our findings also suggest that the impact of such policies will vary by context. In countries where the dominant innovation focus already supports ARIR (as in Germany), policy can reinforce and accelerate existing tendencies. In countries where the dominant innovation focus is oriented toward cost and speed (as in India), policy interventions may need to be more direct, creating incentives that make responsibility-oriented innovation economically attractive rather than relying on voluntary adoption.

Finally, our findings carry implications for how multinational firms manage RIM across their global operations. Innovation managers in multinational firms should not assume that RIM practices developed in one subsidiary will transfer smoothly to another. Instead, they should use the degree/form framework to assess RIM in each operating context and design locally adapted routines. Our findings on top management advocacy suggest that regional leaders who champion RI within their national context can serve as effective amplifiers, particularly in settings where institutional support for responsibility is weaker. Firms can also use cross-national variation strategically, learning from subsidiaries that have developed strong routines in specific pillars and adapting those routines (rather than transplanting them directly) to other contexts.

5.3 | Limitations and Future Research

Our qualitative study, with 60 innovation managers and top-level decision makers in multinational for-profit firms across Germany, India, and Japan, provides rich insights that form the basis of our conceptual model on RIM. While our research develops novel theory on RIM, including the effect of national context and culture, we do acknowledge certain limitations that raise several future research avenues. Future research could test the proposed relationships using larger-sample designs, broaden the country set, and examine whether the model holds for smaller firms and SMEs, which are key to innovation in many economies. Studies could also triangulate interview data with archival evidence and observational process data to capture how ARIR routines are enacted over time. Future research could also investigate individual-level factors (e.g., by comparing managers in the same position) and organizational culture variables as additional antecedents of RIM. A larger country set varying on dominant innovation focus and cultural dimensions could reveal antecedent configurations shaping RIM, including whether firms in similar country clusters benefit from cross-cluster collaboration. Further, following Lehoux et al. (2021), we advocate for a comparative, longitudinal study that examines the change in, and impact of RIM over time. Finally, we encourage scholars to replicate our findings and to subject our propositions to other forms of empirical evidence.

In conclusion, our grounded-theory study of innovation managers and top-level decision makers in for-profit firms in Germany, India, and Japan advances RI scholarship by theorizing RIM as an organizational innovation, the degree and form of systematic ARIR integration into innovation management. We show how external environments, dominant national innovation foci, and, most importantly, how cultural value systems shape which ARIR mechanisms firms prefer and how they manage the economic-responsibility paradox, with top management advocacy amplifying ARIR integration where institutional support is weaker. By linking these antecedents to pillar-specific implementation patterns and tension-management outcomes, our model offers a culturally informed foundation for future research and actionable guidance for managers implementing RI in profit-driven settings.

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Ethics Statement

The authors have read and agreed to the Committee on Publication Ethics (COPE) international standards for authors.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

¹ Sensitizing concepts are guiding interpretive ideas rather than rigid, predefined categories. They provide starting points for qualitative analysis and orient the researcher to relevant phenomena without fixing the results in advance (Bowen 2006; Charmaz 2000). We used the ARIR pillars to identify how RIM appeared in firms' innovation processes, without treating them as fixed templates and while remaining open to patterns emerging from the data.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** Supporting Information.