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Uncovering the Paradox of Affordable Innovation: The Divergent Effect of Innovativeness on Managers' Attitudes Toward Affordable Innovation

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ABSTRACT

Affordable innovation refers to new products and services that target customers with a low willingness or ability to pay. Although they can provide significant economic and societal benefits, managers often prefer premium innovations to affordable innovations. To understand the factors that lead managers to reject affordable innovations, we hypothesize several antecedents at the individual, firm, and product levels to the individual affordable innovation rejection attitude. We conduct a cross-national study and test a structural equation model with 319 participants from Germany, the United States, and South Africa. The results show that individual innovativeness plays a central but contradictory role in managers' attitudes toward affordable innovation. While general innovativeness leads to positive attitudes toward affordable innovation, technological innovativeness drives rejection of affordable innovation. Individual perceptions of firm-level and product-level factors are also important. Individuals' rejection of affordable innovation in managerial contexts in turn leads to lower investment in affordable innovation projects. We corroborate and enrich these findings also in a qualitative follow-up study. With this research, we contribute to the literature on innovation management by explaining the conditions under which managers reject affordable innovations.

1 | Introduction

Affordable innovation refers to new products and services that target at customers with a low willingness or ability to pay (Gurtner et al. 2023; Reinhardt, Gurtner, and Griffin 2018). These innovations meet the modest price expectations of (low-income) customers while creating benefits for those customers. Affordable innovations are therefore usually not simply a resale of premium innovations, but are tailored to the specific needs of customers at the lower end of the market (Ernst et al. 2015). An example of an affordable innovation is low-cost (electric) cars for European customers that are easy to build yet meet

customers' high design standards (SPIEGEL Mobilität 2021). Such affordable innovation can bring economic and societal benefits (Schuster and Holtbrügge 2014), as the market of low-income customers is often not addressed, but has great purchasing power overall and is generally receptive to quality products tailored to their needs (Nakata and Weidner 2012). The Dacia Sandero, for example, is an affordable car with a modern design that targets low-income customers and is known to be the best-selling private car in Europe (Group 2022).¹

Interestingly, although affordable innovations are beneficial to companies and certain customer segments due to the

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potentially large consumer base, managers and decision makers often seem to favour premium innovations over affordable innovations (Lettice and Thomond 2008; Reinhardt, Gurtner, and Griffin 2018; Reinhardt et al. 2024), and when companies launch new products, they typically target the high end of the market first (Van Orden, van der Rhee, and Schmidt 2011). While research shows that cognition and attitudes of managers play an important role in such innovation decisions (Lettice and Thomond 2008; Reinhardt et al. 2024; Schaarschmidt et al. 2022), there is no systematic quantitative research on the specific drivers of innovation managers' attitudes toward affordable innovation. The reason for the sparse literature on managerial attitudes toward affordable innovation is that most of the literature on affordable innovation or related concepts such as frugal or resource-constrained innovation focus on the firm level (e.g., Ernst et al. 2015; Hossain 2022; Reinhardt, Gurtner, and Griffin 2018; Zeschky, Winterhalter, and Gassmann 2014). In this study, we therefore ask the research question: *what factors influence managers to reject affordable innovations?*

It is important to understand the factors that lead to such managerial attitudes and the resulting behaviours that favour or disfavour affordable innovation, as they enable firms to unlock the economic potential of underserved markets and create value for customers at the lower end of the market. Because there is a paucity of research overall on managers' attitudes to embrace affordable innovation, we lack evidence on several key questions. First, there is a lack of systematic quantitative measurement of perceptions of individual-, firm-, and product-specific antecedents to managerial rejection of affordable innovations. Second, there has been no research on how the attitudes of managers who reject affordable innovation affect notable outcomes such as investment in affordable innovation. Finally, given the different values that affordable innovations have in different economic contexts (i.e., countries with higher or lower proportions of low-end customers), research would benefit from insights that are validated in different cultural, social, and economic markets (Schaarschmidt et al. 2022).

To address these research gaps, we conduct a cross-national study to understand the antecedents of managers' attitudes toward affordable innovation rejection and how this attitude translates into investment decisions. We distinguish between individual-level factors and, perceived firm-, and product-level factors. At the individual level, we conceptualize managers' *general innovativeness* and their *technological innovativeness* as antecedents of affordable innovation rejection (AIR) attitudes. At the firm level, we consider perceptions of *firm resources for innovation* and *product positioning strategy* as antecedents to AIR attitudes. Finally, at the product level, we examine the role of *ecological product perceptions* and *social product perceptions* of affordable innovations. Results from structural equation modelling and a sample of 319 participants with managerial experience in Germany, the U.S., and South Africa show that respondents' general innovativeness – but not technological innovativeness – leads to positive attitudes toward affordable innovation. If the firm's product positioning strategy is perceived to favour affordable innovations and if affordable innovations are perceived to be socially and ecologically friendly, managerial rejection attitudes are lower. Beyond the antecedents of attitudes toward affordable innovations, we also showed that attitudes

translate into behavioural consequences: The higher the individual rejection of affordable innovations, the lower the willingness of managers to invest in affordable innovation projects.

In this study, we contribute to the literature on individual innovativeness and affordable innovation by showing that individual innovativeness can be a double-edged sword for managerial attitudes toward affordable innovation: General innovativeness leads to a positive attitude toward affordable innovation (and hence, less rejection), but technological innovativeness leads to a stronger rejection of affordable innovation. In addition, we show the importance of perceived firm and product characteristics on respondents' attitudes, but also that there are cross-national differences. Our study thus underscores the need for a nuanced view of the antecedents of managers' attitudes toward affordable innovation.

2 | Theory and Hypotheses

2.1 | Defining Affordable Innovation

Research has shown that innovation and product managers often show a preference for technologically advanced quality products that typically appeal to a solvent customer base (Reinhardt, Gurtner, and Griffin 2018; Reinhardt et al. 2024). Serving the lower end of the market with targeted, affordable products combines tapping into a potentially large customer segment with satisfying unmet needs—a fact that is particularly important for emerging markets (Ernst et al. 2015). Consistent with previous research, we define affordable innovations similar to low-end innovations as new products or services that target customers with low willingness or ability to pay (Gurtner et al. 2023; Reinhardt, Gurtner, and Griffin 2018; Schaarschmidt et al. 2022). Unlike new products that are first introduced in the premium segment (and then trickle down to the lower end of the market), affordable innovations are developed specifically to meet the specific needs of the lower end of the market. Reinhardt, Gurtner, and Griffin (2018) and Lettice and Thomond (2008) demonstrate that the particularities of affordable innovations require other firm capabilities and a different mindset of managers compared to premium innovations. While concepts such as frugal innovation or resource-constrained innovation emphasize the product perspective (e.g., focus on core functionalities, Weyrauch and Herstatt (2017)) and the resource perspective (e.g., a cost-constrained environment, Zeschky, Winterhalter, and Gassmann (2014)), affordable innovation 1) takes an integrative perspective by emphasizing the customer and market perspective (i.e., willingness/ability to pay, lower price end of the market) and 2) is applicable to any market and not just to markets that are characterized by frugality.

Hence, many examples of affordable innovation also exhibit characteristics of frugal innovation, such as cost-effectiveness, high quality, and robustness (Agarwal, Oehler, and Brem 2021). However, the concept of affordable innovation is not limited to developing economies and the 'Bottom of the Pyramid' (Prahalad 2012); it can be applied to any economy in which a significant portion of the potential customer base has a low ability or willingness to pay. Affordable innovation is thus a broader term that may or may not include frugal innovation,

as it focuses mainly on below-average market prices (like the Dacia Sandero in the cars category) and does not necessarily require other frugal features such as a resource-constrained environment. Such affordable innovations often focus on core functions to satisfy basic needs and target large groups of consumers (Schaarschmidt et al. 2022). In this way, they can meet the needs of many low-income customers. Yet, many companies are reluctant to focus on affordable innovations (Lettice and Thomond 2008; Reinhardt, Gurtner, and Griffin 2018; Reinhardt et al. 2024). While the decision to adopt affordable innovations is undoubtedly a business decision, research shows that the attitude of individual managers is important for product decisions (e.g., Jespersen and Bysted 2016; Sedighadeli and Kachouie 2013) and could ultimately determine whether companies reject or promote affordable innovations.

2.2 | Antecedents of Managerial Attitudes to Promote or Reject Affordable Innovation

To better understand the antecedents of managers' attitudes toward affordable innovation, we draw on the innovation management literature that focuses on individual innovation behaviour and attitudes (e.g., Goepel, Hölzle, and zu Knyphausen-Aufseß 2012; Wu, Parker, and De Jong 2014). Previous literature has already defined the individual attitude to reject affordable innovation as an expression of an individual decision maker's evaluative stance toward affordable innovation, which includes emotional (i.e., feelings and moods toward affordable innovation), cognitive (i.e., thoughts and opinions about affordable innovation), and conative components (i.e., past behaviours toward and experiences with affordable innovation) (Schaarschmidt et al. 2022). Similar to Schaarschmidt et al. (2022), we focus on the rejection attitude rather than acceptance attitude to understand the current tendency why managers tend to reject affordable innovation. While managerial attitudes can strongly influence innovation decisions and firm performance (e.g., Antons et al. 2017; Kraft 2022; Wilden et al. 2022), we do not know what factors determine managers' attitudes toward affordable innovation at the individual level. Affordable innovations differ conceptually and strategically from other types of innovations because they focus on customers at the lower end of the market with limited willingness/ability to pay, and their successful development requires specific firm capabilities (Reinhardt, Gurtner, and Griffin 2018), which are recursively shaped by individual preferences for or against affordable innovations (Schaarschmidt et al. 2022).

There is very little prior literature on the antecedents of individual managers' attitudes toward affordable innovation (for a recent exception, see Gurtner et al. 2023), as most of the literature on affordable innovation or related concepts such as frugal or resource-constrained innovation focus on the firm level (e.g., Ernst et al. 2015; Hossain 2022; Reinhardt, Gurtner, and Griffin 2018; Zeschky, Winterhalter, and Gassmann 2014) but not on managerial attitudes. The sparse literature examining managerial decision making related to affordable innovation, shows that cognitive aspects and biases, individual characteristics and motivations play a major role for managers' decisions to engage in or reject such type of innovations. First, Lettice and Thomond (2008), for example, show that it is managers'

restrictive mental models that lead to 'rejection strategies' that prevent the allocation of resources to disruptive (low-end) innovations. Moreover, research suggests that an irrational 'high-end bias' explains managers' preference for premium innovations (Reinhardt et al. 2024). In addition to these cognitive aspects and biases, Schaarschmidt et al. (2022) show in their scale development paper the relevance of individual characteristics such that the attitude to reject affordable innovations is negatively correlated with empathic decision making and positively correlated with the price-quality association; individuals with a higher attitude to reject affordable innovations also tend to rate premium innovations better. Third, motivations and prior experience are crucial factors that influence managerial decision-making toward affordable innovation. Hossain and Sarkar (2021), for example, found that frugal entrepreneurs are driven by approach to innovation (e.g., persistence, passion, doing something for the common good, direct experience of hardship) and institutional support. Moreover, Hossain et al. (2022) state that personal drive (e.g., desire to improve the health and living standards of people, personal and professional experiences) is relevant for frugal entrepreneurs. Similarly, research on managerial pricing strategies and radical innovation shows the importance of managerial mindset, cognitive biases and personality traits (Kienzler 2017, 2018; Sandberg and Aarikka-Stenroos 2014). Finally, the context of decision makers also influences their attitudes toward affordable innovation. Gurtner et al. (2023), for example, show in their qualitative work that the decision to pursue affordable or premium innovations depend both on individual factors (i.e., personal consumption behaviour, personal background, personal fulfilment, intuition) and on contextual factors (i.e., strategic advantage, firm fit, market power, societal value). Hence, from this literature, it appears that managerial attitudes are critical to allocating resources to affordable innovation projects and that those are influenced both by individual and contextual factors. However, previous literature has not established and quantitatively measured a specific empirical framework for affordable innovation that comprehensively addresses the individual and contextual antecedents of managers' decision making for or against affordable innovation.

We seek to identify the factors that lead managers to prefer and invest in affordable innovations. We draw on existing frameworks on general innovation adoption (by managers) that show the relevance of individual-level, firm-level, and product-level antecedents (Damanpour and Schneider 2009; Frambach and Schillewaert 2002; Gurtner et al. 2023; Wisdom et al. 2014), and adapted them to our situation of individual decision-making. The specific antecedents selected are mainly based on the qualitative study by Gurtner et al. (2023), who identified individual factors (e.g., personal consumption behaviour related to quality or personal fulfilment related to creativity) and contextual factors (e.g., societal value, firm fit and strategic advantage) that drive innovators to engage in affordable and premium innovation. At the individual level, we focus on *general innovativeness* and *technological innovativeness* as potential antecedents to the rejection of affordable innovations. In terms of individuals' perceptions of the firm level, we analyse the impact of managers' perceptions of *firm resources for innovation* and *product positioning strategy*. In terms of individuals' evaluation of the product level, we examine the impact of *ecological product perceptions* and *social product perceptions*. Finally, we aim to determine how managerial

rejection of affordable innovation affects investment decisions for exemplary affordable and premium innovation projects. In addition, external environmental influences, such as country context, can also affect innovation attitudes and behaviour, so we test our hypotheses in a variety of contexts. In the following, we therefore hypothesize the effects of the determinants of managers' negative attitudes toward affordable innovation and their effects on investments in affordable innovation projects. Figure 1 provides an overview of our conceptual model.

2.3 | Individual-Level Antecedents

Research shows that individual innovativeness is an important driver of new product adoption, in both consumer and work contexts (Im, Bayus, and Mason 2003; Marcati, Guido, and Peluso 2008). While innovativeness is mainly studied in the consumer context to explain new product adoption behaviour, there is evidence that individual innovativeness is also important in the work context. For example, an individual's openness to change influences his or her idea screening behaviour (Sukhov et al. 2018) and openness to experience is related to creative behaviour in the workplace (George and Zhou 2001). However, depending on how innovativeness is defined, it can have different effects. Individual innovativeness can be conceptualized at different levels of abstraction—at a higher level of abstraction it relates to a more general or innate personality trait and at a lower level of abstraction it is more domain-specific to a particular product category (Goldsmith and Hofacker 1991; Midgley and Dowling 1978). We propose that managerial attitudes toward affordable innovation depend on the type of innovativeness being considered. Gurtner et al. (2023) found that both affordable and premium innovators refer to creativity at work as an important determinant of their innovation decision, suggesting that different types of innovativeness may be relevant to them.

First, domain-specific innovativeness toward technology-oriented products (i.e., technological innovativeness) could lead to higher managerial rejection of affordable innovations. Affordable innovations target the lower end of the market by being priced below the average for a given product category. To achieve lower prices, these innovations often focus on core functions and are therefore simpler and more robust, although they are not necessarily technically or qualitatively inferior (Ernst et al. 2015). However, because affordable innovations typically eschew technical gimmicks, they may be less interesting to develop for innovators and managers who prefer technological innovations. If innovators prefer products with many additional technological features in their personal lives, they might also transfer this preference to the work context. Individuals are inclined to a self-reference bias, which may lead them to select a target market that matches their own character (Greenacre et al. 2017). Therefore, individuals with high technological innovativeness in the consumer context, i.e., the 'extent to which a consumer is motivated to be the first to adopt new technology-based goods and services' (Bruner and Kumar 2007, p. 331), are less likely to prefer affordable innovation in the work context.

Hypothesis 1. *The higher the individual's technological innovativeness, the higher the affordable innovation rejection (AIR) attitude.*

Second, general innovativeness describes trait-based willingness to change (Hurt, Joseph, and Cook 1977) and is a predictor of innovation adoption behaviour (Im, Bayus, and Mason 2003). This includes valuing new ideas and new ways of thinking—including those that go beyond traditional approaches to innovation, such as affordable innovation. Previous research has shown that general innovativeness is positively related to openness to new experiences (Marcati, Guido, and Peluso 2008) and a riskier exploration orientation

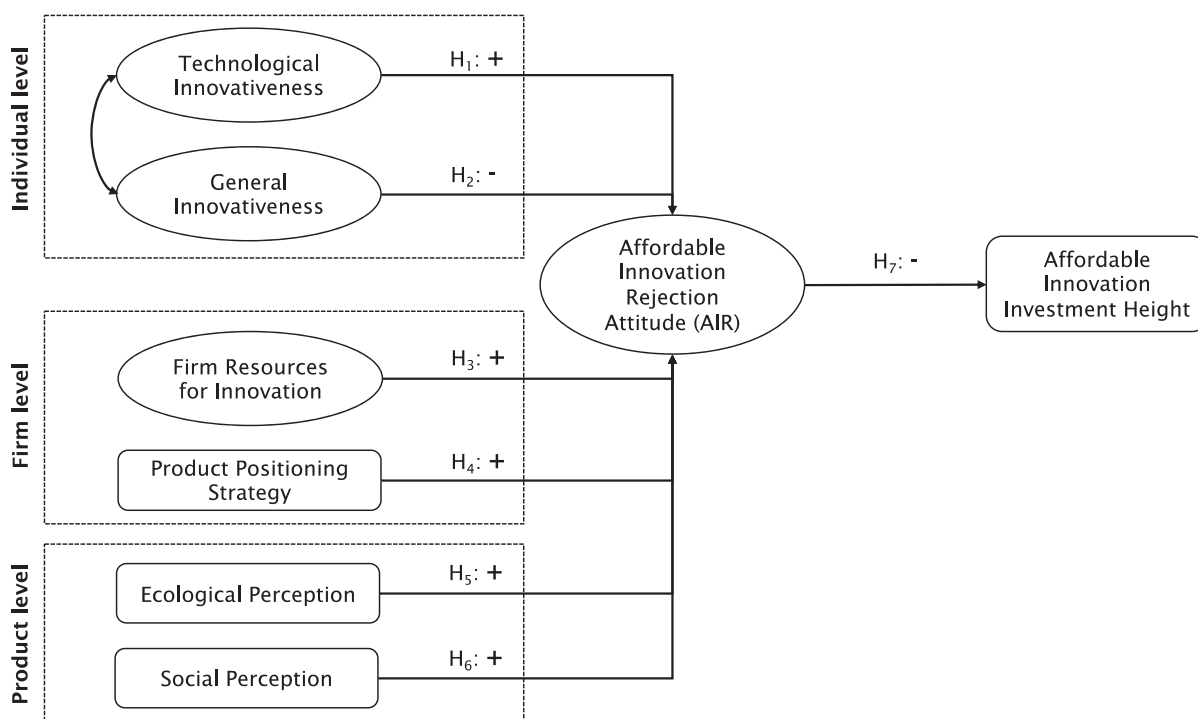


FIGURE 1 | Structural model. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

(Wang and Dass 2017). Exploration orientation and openness to new experiences could enable decision makers in the innovation context to engage in such non-traditional innovations instead of more traditional premium innovations. Affordable innovation requires a high level of innovativeness because affordable innovators need to find innovative ways to reduce costs while understanding and meeting the specific customer needs of the often unknown target audience at the same time (Reinhardt, Gurtner, and Griffin 2018). Hence, the usual approach to innovation favours projects with high costs and high profit margins (Reinhardt, Gurtner, and Griffin 2018), and developing affordable innovations requires non-traditional and radical thinking. Decision makers who have high general innovativeness and incorporate new ways of thinking – beyond traditional technology-driven approaches – may therefore be better suited for affordable innovation.

Hypothesis 2. *The higher the individual's general innovativeness, the lower the affordable innovation rejection (AIR) attitude.*

2.4 | Perceived Firm-Level Antecedents

In addition to individual characteristics, perceptions of determinants at the firm and product level are also important for managerial attitudes. We focus on perceptions rather than objective evaluations because it is the individual perspective on the (corporate) context and innovation characteristics that determine individual innovative attitudes and behaviours (e.g., Abstein, Heidenreich, and Spieth 2014; Frambach and Schillewaert 2002).

First, resources (i.e., human, physical, and financial) have been shown to play an important role in firms' ability to innovate. However, depending on external conditions and efficient use of resources, resources or lack thereof can have positive and negative effects on firms' ability to innovate (De Massis et al. 2018; Katila and Shane 2005). On the one hand, resources form the basis for innovation activities; on the other hand, resource scarcity and lack can be an incentive for creativity (Gurtner, Spanjol, and Griffin 2018). While the effects of resources on innovation are generally uncertain, we expect that more perceived firm resources lead to a lower managerial preference for affordable innovation. When managers believe that their firm has many financial, human, and physical resources, they are not constrained in their innovation activities and have the opportunity to develop additional features that lead to more expensive products. Affordable innovation is often realized through a frugal approach characterized by minimizing financial and material resources (Albert 2019). When corporate resources are limited, innovators must use limited-resource strategies, such as bricolage, to innovate. In this case, affordable innovation projects are the easier option to implement, leading to a more positive attitude of innovators toward the development of affordable innovations.

Hypothesis 3. *The higher the perception of firm resources available for innovations, the higher the affordable innovation rejection (AIR) attitude.*

Similarly, a company's strategic positioning affects innovation activities. Existing strategic positioning and established

structures, prevailing practices, and associated institutional logics can constrain innovators who pursue nontraditional paths (Van Dijk et al. 2011). Radical innovations, for example, require different strategic approaches than incremental innovations to manage the uncertainty and unfamiliarity that accompany them (McDermott and O'Connor 2002). Similarly, Reinhardt, Gurtner, and Griffin (2018) show that low-end innovations require a certain internal culture and commitment (e.g., 'resourcefulness'). Only when innovation activities are congruent with the corporate strategy, the company commits resources to these activities. In fact, the decision for an affordable or a premium innovation is influenced by the perceived fit to the firm (Gurtner et al. 2023). Therefore, a company must strategically support affordable innovations so that innovators have the opportunity to pursue them and develop a positive attitude toward them. We therefore hypothesize that only if the company is perceived as a strategic supporter of affordable innovations will innovators be more likely to move away from traditional paths (i.e., high-cost, high-tech) and favour affordable innovations.

Hypothesis 4. *The higher the perception that the product positioning strategy is focused on premium innovations, the higher the affordable innovation rejection (AIR) attitude.*

2.5 | Perceived Product-Level Antecedents

In addition to individual characteristics of innovators and perceptions of organizational characteristics, perceived characteristics of the product category itself may also influence managerial attitudes toward affordable innovations. Environmental and social considerations in the development of new products (e.g., in the form of eco-innovation or social innovation) are becoming increasingly important to managers given the grand challenges and sustainable development goals (Gurtner and Soyez 2016; Lee, Spanjol, and Sun 2019). Therefore, many innovators consider environmental and social aspects when making product development decisions (Gurtner et al. 2023). Moreover, innovators' attitudes toward innovations are influenced by the perceived environmental and social value innovations create: The more they feel that a new product has environmental and social value, the less likely they generally decide against such innovations—irrespective of whether it is a premium or affordable innovation attempt.

To this end, affordable innovations that address limited resources may be perceived as environmentally beneficial, and affordable innovations that open new markets to low-income consumers may be perceived as socially beneficial. Hence, many affordable innovations have, by definition, a social and even often an environmental benefit. However, innovators may also perceive premium innovations as environmentally and socially beneficial, for example, when new products incorporate a new technology to reduce emissions or when new technologies drive societal progress in general (Gurtner et al. 2023). In relation to managerial attitudes, we argue that if innovators generally perceive premium innovations as more environmentally and socially beneficial, their managerial attitudes toward affordable innovations are less positive. Similarly, we argue that if innovators perceive affordable innovations as generally environmentally and socially beneficial, they are less likely to reject

such innovation attempts. Specifically, as specific attitudes are informed, in part, by general beliefs, it can be argued that the stronger an innovator generally believes that affordable innovations create environmental and social value (compared to premium innovation), the less deprecatory their specific attitudes toward affordable innovations will be.

Hypothesis 5. *The stronger individuals perceive premium innovations (compared to affordable innovation) as ecologically beneficial, the higher the affordable innovation rejection (AIR) attitude.*

Hypothesis 6. *The stronger individuals perceive premium innovations (compared to affordable innovation) as socially beneficial, the higher the affordable innovation rejection (AIR) attitude.*

2.6 | Attitude–Behaviour Link

Several theoretical models related to innovation adoption assume that attitudes and intentions precede behaviour: The more positive the attitudes toward an innovation, the stronger the intention to adopt it, and the more likely the adoption behaviour (Goepel, Hölzle, and zu Knyphausen-Aufseß 2012). In the context of innovators pursuing affordable innovations, this means that the more positive an innovator's managerial attitude toward affordable innovations is, the more likely it is to lead to corresponding innovative behaviours, such as developing, investing in, and/or implementing affordable innovations in the marketplace. In this study, we focus specifically on the willingness to invest in affordable innovation projects, as this behaviour is not limited to innovators but to managers in general.

Hypothesis 7. *The higher the affordable innovation rejection (AIR) attitude, the lower the investment in affordable innovations.*

3 | Method

To address our research gaps and answer the research question, we follow a sequential mixed-method approach as suggested by Venkatesh, Brown, and Bala (2013). Several forms of mixed-method research exist; mostly quantitative and qualitative approaches are combined into a single study to take advantage of both worlds (Johnson and Onwuegbuzie 2004). Our approach can be classified “sequential” as it uses quantitative elements to test the hypotheses and qualitative interviews to corroborate and enrich the quantitative findings. We report on both forms in the following.

To test our hypotheses, we recruited participants through the crowd-sourcing platform Prolific Academic. Prolific Academic is a suitable platform for participant recruitment because it is known to provide better data quality compared to alternatives such as Amazon Mechanical Turks (Peer et al. 2017) and has been used in previous research projects focused on innovation management (e.g., Kraemer et al. 2023). We applied two selection criteria for Prolific Academic: Participants had to have management experience and indicate that their country of residence was either Germany, the United States, or South Africa.

We choose these three countries because of their cultural and socioeconomic differences. For example, these three countries differ in the equality of income distribution in their populations (e.g., Gini index) and in GDP per capita (The World Bank 2022), which could indicate a country's need for affordable innovation. They also differ in their innovation capacity (e.g., Global Innovation Index) (WIPO 2022), uncertainty avoidance, and long-term orientation (Hofstede Insights 2022), which could indicate different approaches to innovation. Affordable innovation has traditionally been focused on developing countries, but is also gaining traction in developed countries (Weyrauch, Herstatt, and Tietze 2020). For us, it is important to extend the validity of our findings beyond the Bottom-of-the-Pyramid and frequently studied countries such as India and China (Agarwal et al. 2016) to include countries with different background characteristics that indicate different needs and opportunities for (affordable) innovation.

In addition, we indicated in the task that ‘it helps if you are an entrepreneur, product/innovation manager or have some experiences with or interest in new product development’. Participants received 2.5 British Pounds for their participation in this 20-min survey. We conducted the survey in Qualtrics. We used existing scales for our central conceptual variable ‘affordable innovation rejections attitude’ (Schaarschmidt et al. 2022) and the two independent variables ‘technological innovativeness’ (Bruner and Kumar 2007) and ‘general innovativeness’ (Hurt, Joseph, and Cook 1977).

To measure the dependent variable ‘affordable innovation investment height’, we relied on the pre-tested procedure proposed by Reinhardt et al. (2024): Participants had to decide how they would allocate a total investment of 10 dollars million between two projects if they were the manager in charge (i.e., they were asked to put themselves in the shoes of a manager). One project was an affordable innovation project while the other was a premium innovation project. To further increase external validity, we provided two different innovation contexts (electric cars vs. ophthalmologic devices), that is, two different survey versions with two different innovation pairs (affordable and premium); a) a solar car project and luxury electric car project pair, or b) a rugged economical eye screening system project and new generation LASIK project pair. Participants were assigned randomly to one of the two pairs to account for innovation context. The amount of investment in the affordable innovation project was used as the dependent variable ‘affordable innovation investment height’ (which could range from 0 to 10 million). We use the context of this investment task (electric cars vs. ophthalmologic devices) as a binary control variable in our analysis. The other independent variables (i.e., ‘firm resources for innovation,’ ‘product positioning strategy,’ ‘ecological perceptions,’ and ‘social perceptions’) and the control variables were measured using questions we developed ourselves (see Table A1). Please note that while we measure our key constructs in a survey and cannot claim causality per se, previous literature on the relationship between attitude and behaviour makes us confident that attitudes generally precede behaviour.

We included several control variables covering individual- and firm-level aspects reported from the perspective of survey respondents to rule out possible endogeneity problems. At the

individual level, we included age, gender, number of NPD projects, years of NPD work experience, years living abroad, degree, income, and religiosity. For example, we expect young or low-income people to be more open to affordable innovation. At the firm level, we included age of the firm, number of employees, and industries. For the latter, we included the most common industries as binary variables. We expect that, for example, managers who work in smaller firms or in more socially conscious industries are more likely to favour affordable innovation. Reverse-coded items of the construct 'general innovativeness' were recoded. For the categorical variables 'gender,' 'industry,' and 'religion,' binary-coded variables were formed (i.e., 'female,' 'industry IT & other information services,' 'industry education,' 'industry human health activities,' 'religiousness').

Below, we describe the descriptive characteristics of the sample, the procedure and results of the confirmatory factor analysis used to test our measurement model, and the structural equation model (SEM) used to test our main hypotheses. Structural equation modelling is an appropriate approach because we measure all relevant independent, dependent, and control variables at the individual level. In addition, because we want to simultaneously test the impact of attitudes toward rejecting affordable innovations (i.e., the intervening variable) on affordable innovation investment height, structural equation modelling is more appropriate than regression analysis. To uncover possible cross-country differences, we apply a multi-group structural equation model, where the groups are the three different countries.

4 | Results

4.1 | Data Collection and Sample

A total of 360 participants responded to the survey (124 from Germany, 117 from the U.S., and 119 from South Africa). Table 1 provides an overview of the number of participants who responded to each construct, mean values and standard deviations for the constructs, and correlations.

Descriptive analysis shows that 44% of respondents were female, 55.5% were male, and 0.5% indicated 'other' as their gender. 41.6% reported a bachelor's degree as their highest degree, followed by 30.3% with a master's degree, 12.6% with a high school diploma, 7.3% with professional training, and 5.9% held a doctorate. Income varied, with 21.8% reporting income below \$1000, 53.2% earning between \$1000 and \$4999 monthly, and 25% reporting income of \$5000 or more. The most common religious affiliation is Catholic (26.8%), followed by atheist (20.8%), evangelical/Protestant (11.5%), and spiritual (11.5%). The most common industries in which participants work include IT and other information services (15.6%), education (9.1%), and human health activities (9.1%).

Regarding our main variable, the mean score for the Affordable Innovation Rejection (AIR) Attitude is 3.13 (SD=1.22), with Germany having a slightly lower mean score (M=2.88, SD=1.11) than the United States (M=3.30, SD=1.39) and South Africa (M=3.22, SD=1.10). The average Affordable

Innovation Investment Height of \$10 million is 5.4 (SD=2.25), with Germany having a slightly higher mean value (M=5.88, SD=2.69) than the United States (M=5.21, SD=2.28) and South Africa (M=5.08, SD=1.95). For our main analysis, we used Stata 15.1. First, we conducted confirmatory factor analysis (CFA) for the latent constructs ($n=357$) to test the measurement model (Table 2).

We eliminated factor loadings below 0.5 and nonsignificant loadings, so 12 of 20 items of the construct 'general innovativeness' had to be deleted. The remaining items belong to the 'Willing to Try' sub-dimension of the general innovativeness construct (Goldsmith 1991). The final measurement model included 22 items for four latent constructs (AIR, technological innovativeness, resources, general innovativeness). Indicator reliabilities (squared multiple correlations) are above 0.4 for all items except AIR, item 5, and general innovativeness, item 15_R, which are 0.39. However, since they are close to the cutoff, we decided to keep them. The factor reliability for all factors is greater than 0.8 and exceeds the threshold of 0.6 (Bagozzi and Yi 1988). The average variance extracted (AVE) exceeds the threshold of 0.5 for technological innovativeness (AVE=0.68) and resources (AVE=0.60) and is close to 0.5 for AIR (AVE=0.45) and general innovativeness (AVE=0.47), indicating largely convergent validity (Fornell and Larcker 1981). In addition, the average variance extracted is higher than the squared correlations between the latent variables, indicating discriminant validity (Fornell and Larcker 1981). Absolut and relative fit indices indicate good model fit for the CFA: $\chi^2=348.76$, $df=203$, $p<0.001$, $\chi^2/df=1.72$ (<3.0), $RMSEA=0.045$ (<0.06), $SRMR=0.048$ (<0.08) and $CFI=0.959$ (>0.95) (Hu and Bentler 1999).

4.2 | Common Method Bias and Measurement Invariance

Since the respondents in our sample are likely familiar with the English language (English is official language in both the U.S. and South Africa, and English is the first foreign language taught in German schools), there is no reason to believe that common method bias (CMB) differs between countries (Steenkamp and Maydeu-Olivares 2021). As a test for CMB, we included an unmeasured common latent factor in our CFA (Morgan, Anokhin, and Wincent 2019; Podsakoff et al. 2003), with all items loading on this factor. The factor loadings of the items on their theoretical constructs remained significant and positive (≥ 0.40). With the exception of one item, the factor loadings of the items on their theoretical constructs did not differ by more than 0.20 between the CFA with and without the unmeasured common factor. In addition, we note that our final dependent variable, investment height is unlikely to be influenced by CMB because it was not captured by Likert scales.

Cross-national research requires testing whether scales are invariant across cultures (i.e., samples). Steenkamp and Baumgartner (1998) suggest testing for configural, metric, scalar, and strict invariance, although it is unlikely that all criteria are fully met, depending on the context (Walsh, Schaarschmidt, and Teng 2020). Testing is usually based on confirmatory factor analyses, sometimes with all model constructs and items involved, sometimes per construct with the particular item

TABLE 1 | Means, standard deviation and correlations of variables.

Variable	N	Mean	SD	1	2	3	4	5	6	7	8	9
1 Affordable innovation rejection attitude	359	3.13	1.22	1.00								
2 Affordable innovation investment height	360	5.40	2.35	-0.207**	1.00							
3 Technological innovativeness	358	4.30	1.55	0.410**	-0.181**	1.00						
4 General innovativeness	358	4.76	1.14	-0.341**	0.118*	-0.116*	1.00					
5 Age	356	33.64	8.28	-0.091	0.102	-0.096	0.113*	1.00				
6 Gender (female)	357	1.57	0.51	-0.017	-0.027	-0.073	0.037	-0.092	1.00			
7 Number of NPD projects	357	5.21	11.18	-0.131*	0.015	0.016	0.204**	0.162**	-0.155**	1.00		
8 Years of work experience in NPD	355	4.37	4.65	0.070	-0.016	0.042	0.114*	0.448**	-0.157**	0.399**	1.00	
9 Years living abroad	345	2.48	5.20	0.009	0.132*	-0.085	-0.012	0.074	-0.069	0.025	0.110*	1.00
10 Degree	356	5.02	1.18	0.203**	-0.039	0.089	0.023	0.110*	-0.089	0.087	0.150**	0.199**
11 Income	353	5.14	3.22	0.272**	0.027	0.206**	-0.060	0.226**	-0.167**	0.188**	0.235**	0.077
12 Religiousness	355	0.74	0.44	0.184**	-0.026	0.243**	-0.191**	0.005	0.087	-0.128*	-0.040	-0.104
13 Firm resources for innovation	357	5.09	1.24	0.169**	0.018	0.209**	-0.056	-0.153**	-0.057	-0.054	-0.019	-0.074
14 Product positioning strategy (affordable vs. premium strategy)	357	0.45	2.70	0.363**	-0.042	0.240**	-0.068	0.026	-0.086	0.106*	0.123*	0.048
15 Ecological perception (affordable vs. premium product)	357	0.09	2.91	0.338**	-0.109*	0.300**	-0.094	0.020	-0.005	0.101	0.118*	-0.070

(Continues)

TABLE 1 | (Continued)

Variable	N	Mean	SD	1	2	3	4	5	6	7	8	9
16 Social perception (affordable vs. premium product)	357	-1.10	3.09	0.340**	-0.153**	0.273**	-0.237**	-0.048	0.022	-0.002	0.013	-0.028
17 Firm age	345	25.39	30.37	0.035	-0.032	-0.019	0.093	0.084	-0.053	-0.025	0.112*	-0.051
18 Number of firm employees	349	5327.84	29787.98	-0.059	0.051	-0.129*	0.049	0.006	-0.043	-0.026	-0.030	-0.009
19 Industry IT & other information services	360	0.15	0.36	0.077	0.035	0.079	-0.041	-0.005	-0.144**	0.124*	0.041	0.009
20 Industry education	360	0.09	0.29	-0.057	-0.019	-0.045	0.022	-0.076	0.018	-0.080	-0.051	-0.039
21 Industry human health activities	360	0.09	0.29	-0.005	-0.028	0.034	-0.041	0.014	0.137**	-0.045	-0.018	-0.029
22 Context investment (electric cars vs. ophthalmologic devices)	360	1.49	0.50	0.035	-0.002	0.038	0.015	0.028	0.007	-0.024	0.051	0.030
Variable	10	11	12	13	14	15	16	17	18	19	20	21
10 Degree	1.00											
11 Income	0.384**	1.00										
12 Religiousness	-0.030	0.050	1.00									
13 Firm resources for innovation	0.144**	0.120*	0.143**	1.00								
14 Product positioning strategy (affordable vs. premium strategy)	0.105*	0.231**	0.115*	0.254**	1.00							
15 Ecological perception (affordable vs. premium product)	0.064	0.144**	0.097	0.175**	0.444**	1.00						

(Continues)

TABLE 1 | (Continued)

Variable	10	11	12	13	14	15	16	17	18	19	20	21
16 Social perception (affordable vs. premium product)	-0.010	0.161**	0.131*	0.166**	0.295**	0.366**	1.00					
17 Firm age	0.167**	0.025	-0.041	0.004	0.102	-0.010	-0.095	1.00				
18 Number of firm employees	0.065	0.025	0.021	0.039	0.091	-0.017	-0.058	0.386**	1.00			
19 Industry IT & other information services	0.014	0.137**	-0.031	0.097	0.038	-0.034	0.121*	-0.110	0.064	1.00		
20 Industry education	0.004	-0.085	0.007	-0.033	-0.104	-0.074	-0.032	0.147**	-0.004	-0.133*	1.00	
21 Industry human health activities	0.103	-0.007	0.074	0.012	-0.002	0.045	-0.006	0.004	-0.049	-133*	-0.098	1.00
22 Context investment (electric cars vs. ophthalmologic devices)	0.038	0.080	-0.021	-0.054	0.050	0.061	0.021	0.016	-0.026	0.105*	0.023	0.004

**p < 0.01, and *p < 0.05.

TABLE 2 | Items and constructs of the confirmatory factor analysis.

Item	Measurement	Factor loading
Affordable innovation rejection (AIR) attitude, Schaarschmidt et al. (2022) Cronbach's alpha = 0.828, factor reliability = 0.829, AVE = 0.447		
1	I am reluctant to new product ideas that target customers who prefer to pay only a minimum.	0.645**
2	Working on ideas that targeted affordable products does not stimulate my creativity.	0.703**
3	In the past, I could not identify with projects that were designed for customers with a low willingness to pay.	0.639**
4	Offering low-priced products is not good for a company image.	0.678**
5	Standard products with simple functionalities bore me.	0.622**
6	I doubt that products for price-sensitive customers can achieve significant results.	0.720**
Technological innovativeness, Bruner and Kumar (2007) Cronbach's alpha = 0.911, factor reliability = 0.912, AVE = 0.676		
1	I get a kick out of buying new high tech items before most other people know they exist.	0.817**
2	It is cool to be the first to own new high tech products.	0.808**
3	I get a thrill out of being the first to purchase a high technology item.	0.885**
4	Being the first to buy new technological devices is very important to me.	0.827**
5	I want to own the newest technological products.	0.768**
Resources, own scale Cronbach's alpha = 0.808, factor reliability = 0.819, AVE = 0.604		
1	We have sufficient access to human resources to be innovative.	0.708**
2	We have sufficient access to financial resources to be innovative.	0.721**
3	We have sufficient access to physical resources to be innovative.	0.890**
General innovativeness ^a , Hurt, Joseph, and Cook (1977) Cronbach's alpha = 0.875, factor reliability = 0.877, AVE = 0.473		
4_R	I am generally cautious about accepting new ideas.	0.632**
6_R	I am suspicious of new inventions and new ways of thinking.	0.662**
7_R	I rarely trust new ideas until I can see whether the vast majority of people around me accept them.	0.778*
10_R	I am aware that I am usually one of the last people in my group to accept something new.	0.706**
13_R	I am reluctant about adopting new ways of doing things until I see them working for people around me.	0.744**
15_R	I tend to feel that the old way of living and doing things is the best way.	0.625**
17_R	I must see other people using new innovations before I will consider them.	0.689**
20_R	I often find myself sceptical of new ideas.	0.650**

Note: An 'R' behind an item means reverse coded.

^aThe original scale consisted of 20 items (see Table A1), but during CFA we eliminated 12 items. The remaining items correspond to the sub-dimension 'Willing to Try' (Goldsmith 1991).

** $p < 0.01$, and * $p < 0.05$

(Blut, Beatty, and Northington 2022). Configural invariance requires good goodness of fit when tested across all groups (i.e., multigroup analysis). In our case, we used all multi-item constructs presented in the conceptual model for a CFA (i.e., with all parameters varying freely between groups) and found $\chi^2/df=1.42$ and $CFI=0.93$, indicating adequate fit and configural invariance. Next, we compared models in which all measurement coefficients must be equal across groups (i.e., metric invariance), in which measurement intercepts must additionally be equal (i.e., scalar invariance), and in which error variances must additionally be equal across groups (i.e., strict invariance). In particular, the methodological literature recommends the use of the ΔCFI criterion for evaluating comparisons because it is independent of sample size and model complexity (Cheung and Rensvold 2002). Any ΔCFI around 0.01 satisfies the invariance requirement (Blut, Beatty, and Northington 2022). The metric invariance model yields a ΔCFI of 0.011 compared to the baseline model, which argues for metric invariance. However, the ΔCFI between the metric and scalar models is 0.034, which is slightly outside the range for satisfying invariance. Moreover, the ΔCFI between the scalar and the strict model is again only 0.009. Consequently, configural and metric invariance is given, while scalar invariance is not fully given (Table A2). Overall, we consider the data suitable for structural equation modelling with multiple groups.

4.3 | Structural Equation Modelling

After eliminating missing values of individual items and control measures, 319 participants remained for the main structural analysis and group analysis (Germany $n=104$, U.S. $n=112$, South Africa $n=103$). Fit indices of the structural equation model with all participants (excluding groups) are $\chi^2=924.63$, $df=600$, $p<0.001$, $\chi^2/df=1.54$, $RMSEA=0.041$, $SRMR=0.081$, and $CFI=0.904$. The fit indices for the multi-group structural equation model (three groups) are $\chi^2=2542.28$, $df=1878$, $p<0.001$, $\chi^2/df=1.35$, $RMSEA=0.058$, $SRMR=0.105$, and $CFI=0.814$. Here, not all fit indices indicate good model fit. However, Hu and Bentler (1999) suggest combined rules for rejection, such as $RMSEA>0.06$ and $SRMR>0.10$. From these points of view, the model fit is still acceptable. The standardized path coefficients of the structural models are shown in Table 3.

Maximum likelihood structural equation modelling was able to confirm H1 and H2, as technological innovativeness is positively related to AIR attitude (coeff. = 0.25, $p<0.01$) and general innovativeness is negatively related to AIR attitude (coeff. = -0.32, $p<0.01$).² H3 is rejected because perception of firm resources available for innovation has no effect on AIR attitude (coeff. = -0.05, $p=0.40$). In addition, we were able to confirm H4, H5, and H6, as perceived product positioning strategy focused on premium innovations and perception of premium innovations as environmentally and socially beneficial are positively related to AIR attitude (coeff. = 0.19, $p<0.01$; coeff. = 0.15, $p<0.01$; coeff. = 0.12, $p<0.05$). Finally, H7 was confirmed, according to which a higher AIR attitude leads to a lower level of investment in affordable innovations (coeff. = -0.21, $p<0.01$). In addition to the effects we hypothesized, several control variables also had an impact on AIR attitude. Specifically, the results show that younger individuals have higher AIR attitudes

(i.e., positive effect of age), that individuals with fewer NPD projects but more years of work experience in NPD have higher AIR attitudes, and that individuals with higher income and higher degrees have higher AIR attitudes. Although not hypothesized, we measured the group differences between country samples found in the multigroup structural equation modelling using the Wald test (for all group differences, see Table 3). Multigroup analysis shows that technological innovativeness is a significant antecedent for the AIR attitude for Germany (coeff. = 0.329, $p<0.01$) and the United States (coeff. = 0.357, $p<0.01$) but not for South Africa (coeff. = 0.158; $p=0.156$). One reason could be that Germany and the U.S. are more technologically oriented in their innovation activities than South Africa (WIPO 2022) and that in these countries technological innovativeness is more relevant for managerial attitudes toward innovation, as this country context promotes a stronger awareness of high technology. In addition, general innovativeness is a significant negative factor for the AIR attitude in the U.S. (coeff. = -0.509; $p<0.01$) and South Africa (coeff. = -0.258, $p=0.010$), but not in Germany (coeff. = -0.187, $p=0.075$). One reason for this could be that the U.S. and South Africa are less long-term oriented than Germany (Hofstede Insights 2022). Since the pursuit of affordable innovation is a less traditional, more radical approach than the pursuit of premium innovation, decision makers in countries with a low long-term orientation need to be particularly innovative to adopt such a non-traditional approach. Firm resources for innovation are not significant for either country. In the U.S., but not in the other countries, a product positioning strategy that favours premium innovations has a positive effect on AIR attitude (coeff. = 0.387, $p<0.01$), and a higher perception of premium innovations compared with affordable innovations as socially positive also affects AIR attitude (coeff. = 0.188, $p=0.022$). A higher perception of premium innovations compared with affordable innovations as environmental is significant for South Africa (coeff. = 0.374, $p<0.01$) and (negatively) significant for the United States (coeff. = -0.109, $p=0.028$), but not for Germany (coeff. = 0.137, $p=0.225$).

4.4 | Robustness Test

To test the robustness of our results, we also applied a mediated regression analysis approach. We use Andrew Hayes' version PROCESS v4.2 for SPSS, which includes bootstrapping for the indirect effects (95% confidence interval; 5000 bootstrap samples). Instead of estimating the measurement model and the structural model simultaneously, we first create indices for constructs with multiple items as averages with equal weights for all items. We then computed a mediated regression analysis for each independent variable separately, with the other independent variables and control variables as covariates. We were able to replicate the results of the structural equation model (i.e., confirming a significant indirect effect of the independent variable via the mediator AIR attitude on affordable innovation investment for H1, H2, H4, and reject the indirect effect for H3), with the difference that the indirect effect for H5 is significant only at $p<0.10$ and that for H6 we see only a direct effect of the independent variable on the dependent variable. We were also able to reproduce most of the differences between the three country samples using a moderated mediation analysis (details on the robustness, see Table A3).

TABLE 3 | Standardized path coefficients of main analysis and group analysis.

Path		Main SEM	Germany	USA	South Africa
Technological innovativeness	→AIR	0.250**	0.329**	0.357**	0.158
General innovativeness	→AIR	-0.323**	-0.187	-0.501**	-0.258*
Firm resources for innovation	→AIR	-0.048	-0.041	-0.039	-0.075
Product positioning strategy (affordable vs. premium str.)	→AIR	0.109**	0.088	0.387**	0.152
Ecological perception (affordable vs. premium product)	→AIR	0.153**	0.137	-0.109*	0.374**
Social perception (affordable vs. premium product)	→AIR	0.122*	0.195	0.188*	0.104
Age	→AIR	-0.115*	-0.113	-0.93	-0.069
Gender (female)	→AIR	0.027	0.117	0.063	-0.096
Number of NPD projects	→AIR	-0.235**	-0.359**	-0.169*	-0.412**
Years of work experience in NPD	→AIR	0.228**	0.380**	0.064	0.246*
Years living abroad	→AIR	-0.028	-0.004	-0.081	-0.020
Degree	→AIR	0.169**	0.148	0.136	0.251*
Income	→AIR	0.130*	0.058	0.158*	0.113
Religiousness	→AIR	0.074	0.128	0.098	0.158
Firm age	→AIR	0.069	0.230*	0.156	-0.006
Number of firm employees	→AIR	-0.081	-0.120	-0.142*	-0.016
Industry IT & other information services	→AIR	0.037	0.068	-0.128	0.182
Industry education	→AIR	-0.032	0.003	-0.173*	0.068
Industry human health activities	→AIR	-0.087	-0.080	-0.109	-0.191*
Context investment (electric cars vs. ophthalmologic devices)	→AIR	-0.029	0.085	-0.088	-0.040
AIR	→AI Investment height	-0.213**	-0.143**	-0.214**	-0.175**
Technological innovativeness	↔General innovativeness	-0.150*	0.007	-0.210*	0.045

Note: Significant differences between the three groups are shaded grey ($p < 0.05$). Mean values of the latent variables Technological innovativeness, General innovativeness and Firm resources for innovation are fixed to zero for the reference country Germany.

Abbreviations: AI, affordable innovation; AIR, affordable innovation rejection attitude.

* $p < 0.05$, and ** $p < 0.01$.

4.5 | Qualitative Follow-Up Study

To further corroborate and extend the results of the study, we sought to discuss with innovation managers the factors that influence managers' attitudes toward rejecting innovations. To this end, we recruited six innovation managers from Switzerland via an innovation management network and LinkedIn (three men and three women, from the fields of finance, coaching, mobility, IT, public transport and household appliances). We asked respondents questions about the influence of individual (technological and general) innovativeness on managers' attitudes, the role of the firm context, in particular firm strategy and resources, and the perception of the sustainability of affordable and premium innovation. We have deductively coded the

relevant text passages relating to the factors influencing managers' attitudes toward affordable innovation and present their explanations below.

Regarding the positive effect of individual technological innovativeness and the negative effect of general innovativeness on the AIR attitude, the innovation managers could relate to understand these results from their own experience. For example, interviewee 4 described that some innovators "want to do something fancy. There is simply a desire to get ahead with something high-tech, super-digitized, and they are seen and praised for it". Frugal approaches are ridiculed because they are less fancy. As a result, the attitude toward affordable innovations is worse among technologically savvy people.

Interviewee 1 also emphasizes this connection: “I often have the feeling that if someone is such a pronounced techie and always wants to try out new gadgets, the focus simply shifts directly to the gadget or you want to test the technology, no matter how, regardless of whether it is a useful case or less useful [for customers].” Interviewee 2 goes on to describe that the rule should be “do not extrapolate from yourself to others,” but often innovators think, “I am into tech, so I am going to build something for people who are into tech,” leading to a focus on premium innovations from technologically innovative individuals. Those with a high level of general innovativeness, on the other hand, leave aside what they themselves think is “cool” and try to better understand the needs of customers, as interviewee 5 describes: “With affordable innovations, it is even more important to look at the big picture and think more from the customer's point of view, i.e. what is really the use case?” and interviewee 3 confirms this: “The second group [those with the general innovativeness] are actually just the real innovators and I think the challenge is crucial, what problem do you want to solve?” Therefore, those with a higher general innovativeness may have a stronger focus on customers and are more likely to see affordable innovation as a suitable solution. However, interviewee 6 was somewhat puzzled by the finding that technologically innovative individuals were more likely to reject affordable innovation, claiming that “we have so many possibilities thanks to technology that we should actually make an affordable innovation”. In general, however, the innovation managers confirmed that technologically innovative individuals see affordable innovations as less ‘fancy’ and the focus shifts away from the (lower income) customer group.

In this context, some interviewees also commented on the differences at country level (e.g., that technological innovativeness is more important for managers' attitudes in countries such as Germany and the United States). Interviewee 4 explains: “If you look at a country, Switzerland also has a large number of vehicles that promote innovation. (...) And they also have a focus, so the Federal Office for Research and Innovation hires people with a technological background to judge who gets funding and who does not. (...) In other words, the funding bodies automatically have a technological background.” Interviewee 1 adds: “I can imagine that it is often about differentiating oneself through technological innovation, perhaps now in Switzerland, because otherwise the products are actually relatively similar and (...) this has an effect on the attitude towards affordable innovations.” Innovative countries such as Switzerland, Germany and the United States therefore have a technological focus, which is also reflected in the relevance of technological innovativeness at an individual level for managerial attitudes.

At the firm level, the innovation managers were very unanimous about the importance of the firm positioning strategy for the attitude toward affordable innovation (“the vision of the company is relatively important,” interviewee 6). The firm positioning strategy guides individuals and the acceptance of affordable innovation in an organization. “If one of these strategic fields of innovation was frugal innovation and this was prioritized over another field of innovation (...), then more would happen in this direction. These are the fine steering mechanisms” (interviewee 4). In many companies, however, the product positioning

strategy is moving in the direction of premium innovation and a focus on affordable innovations is perceived as potentially damaging for the firm: “We are now positioning ourselves even more towards premium. In that respect, I think there is a reputation and a risk of losing that reputation in a different direction” (interviewee 5). Consequently, the company's positioning strategy has a strong influence on the attitude of the individual: “I have the feeling that it is mainly the firm level that then has almost more of an impact than the other levels, so even if you are intrinsically motivated as an innovation manager to do something in the area of affordable innovation, (...) but then you keep getting feedback that it does not fit the strategy, that you should rather focus on something else” (interviewee 1). While the strategic positioning of a firm is of great importance for the attitude, firm resources did not show any significant influence in our quantitative study. The opinions of the innovation managers interviewed also varied here, which could reflect the overall insignificant effect. For example, interviewee 6 is of the opinion that more resources favour affordable innovations (“the financial situation of the firm [has an influence] (...) so that they can afford something like this at all, because affordable innovations are not cheap”), but interviewee 3 is of the opinion that fewer resources favour affordable innovations (“the more resources there are, the more you can attract more affluent customers and where there is already little money, you can also be in the low-price segment”). Interviewee 1 explains the lack of influence of firm resources with the relevance of other aspects: “I often have the feeling that it is not so much the resources that are a problem (...), but rather the support and backing you get from the management.”

Finally, regarding the ecological and social perception of affordable and premium innovation and their influence on AIR attitudes, innovation managers emphasized that premium [affordable] innovations can be perceived as more (environmentally) sustainable and are therefore preferred. Interviewee 1 explained that in her firm “the more ecological options have always been more expensive than the normal ones. So, the sustainable [product] would have cost a bit more because the effort involved is greater.” Consequently, premium innovations are seen as more ecological, which in turn influences managerial attitudes in favour of premium innovations. Interviewee 6 is of the opinion that affordable innovations can save more resources and can therefore be perceived as more ecological and consequently more advantageous. Depending on whether affordable or premium innovations are associated with environmental and social sustainability, attitudes toward them may therefore be more favourable. Overall, the qualitative follow-up study provided further explanations and validations for the observed relationships between the influencing factors at individual, firm and product level and the AIR attitudes of managers.

5 | Discussion

In our research, we found that individual innovativeness can have two sides: Individuals with high technological innovativeness are more likely to reject affordable innovations in a managerial context, while individuals with high general innovativeness have more positive attitudes toward affordable innovations. We also found that when individuals perceive the corporate strategy

as favourable to premium innovations, they show a stronger managerial rejection of affordable innovations. Moreover, when individuals perceive premium innovations as more environmentally and socially valuable than affordable innovations, they also reject affordable innovations more strongly. However, perceived company resources for innovation do not seem to influence individuals' managerial attitudes toward affordable innovations. One reason for this result could be that resources do influence the feasibility of developing premium and affordable innovations, but not the individual's attitude per se. Finally, we also showed that negative managerial attitudes toward affordable innovations affect behaviour: individuals who strongly oppose affordable innovations are also less likely to invest in affordable innovations.

5.1 | Theoretical Implications

Research has acknowledged the important role of managers' attitudes in resource allocation for affordable innovation (Lettice and Thomond 2008; Reinhardt et al. 2024; Schaarschmidt et al. 2022), but there has been almost no systematic research effort to understand the various drivers of managers' attitudes toward affordable innovation. Our contribution to research is twofold.

First, we contribute to the literature on individual innovativeness (e.g., Goldsmith, Freiden, and Eastman 1995; Kaushik and Rahman 2014). We show that innovativeness can have different effects depending on the conceptualization. Indeed, previous literature on innovation management has identified different effects for general innovativeness (also called 'innate' or 'global' innovativeness) and domain-specific innovativeness. For example, general innovativeness as a personality trait is not as predictive to actual adoption as consumer innovativeness in a particular domain, as a higher level of abstraction (i.e., general innovativeness) tends to have less predictive power for behaviour than a lower level of abstraction (i.e., domain-specific innovativeness). Previous literature considers domain-specific innovativeness, e.g., technological innovativeness, as a mediator between general innovativeness and actual innovative behaviour, assuming a positive relationship between both types of innovativeness (Goldsmith, Freiden, and Eastman 1995; Kaushik and Rahman 2014). However, we show that general and domain-specific innovativeness may even have *divergent* effects in certain innovation contexts. We believe that this divergent impact is due to differences in openness to nontraditional approaches: while technological innovativeness focuses narrowly on new technical features, general innovativeness may also emphasize unconventional, holistic, and sometimes less technological approaches such as affordable innovation. Thus, in the innovation management literature, general innovativeness and domain-specific innovativeness should no longer be viewed as just two levels of abstraction of a construct. Rather these two constructs could lead to different effects in specific product categories, such as affordable innovations.

Second, our study contributes to the literature on affordable innovation (e.g., Ernst et al. 2015). We use a quantitative approach to measure, for the first time, the various antecedents

of individuals' managerial attitudes toward affordable innovation. In doing so, we draw on the existing literature suggesting that the firm's decision to adopt or reject affordable innovation depends on individual managerial characteristics (e.g., Gurtner et al. 2023; Reinhardt et al. 2024; Schaarschmidt et al. 2022). We show that a nuanced consideration of the antecedents of managerial attitudes related to affordable innovation is necessary: Not only do individual-level factors such as general and technological innovativeness influence managers' rejection of affordable innovations, but also individual perceptions of firm-level factors (e.g., product positioning strategy) and product-level factors (e.g., environmental and social perceptions). While we know from previous literature that antecedents at different levels can be relevant for innovation attitudes and behaviour (Damanpour and Schneider 2009; Frambach and Schillewaert 2002; Wisdom et al. 2014), we explicitly show which factors are relevant for the case of affordable innovation. This is important because these factors can differ greatly depending on the type of innovation under consideration. In addition to previous literature discussing cognitive biases and personality traits in the context of affordable innovation or managerial pricing (e.g., Kienzler 2017; Kienzler 2018; Reinhardt et al. 2024; Schaarschmidt et al. 2022), we highlight new antecedents and provide a comprehensive framework of individual-level antecedents as well as managers' perceptions of product- and firm-level antecedents to the decision to reject or engage in affordable innovations. Thus, we extend the knowledge that the influence of individual managers on the promotion or rejection of affordable innovation is important at the firm level by examining the conditions under which managers promote or reject affordable innovation. This also has important implications for practice.

5.2 | Practical Implications

When decision makers seek to promote affordable innovation in organizations, they need to know that managers' attitudes and behaviours are responsible for promoting or rejecting affordable innovation at the firm level. Therefore, it is extremely important that managers promote affordable innovation because if they do not, they are less likely to invest in this type of innovation. However, companies are potentially missing out on major economic and societal benefits if they reject affordable innovation.

If companies want to foster affordable innovation, they need to pay attention to the type of managers they hire to develop products and the corporate and cultural environment they confront: Only managers with high general innovativeness, who perceive affordable innovation as environmentally and socially valuable, and who are assigned to a corporate context with an affordable product positioning strategy are likely to endorse and invest in affordable innovation. So technologically innovative managers are not necessarily the right people for affordable innovation projects. Companies also need to ensure that they provide a suitable environment for affordable innovation. If innovators perceive the corporate environment as heavily focused on premium innovation, they may not consider the company capable or conducive to affordable innovation and therefore may not dare to pursue it. Finally, companies should also make it clear to their employees that affordable innovations offer economic, social, and environmental benefits. When innovators recognize these

benefits of affordable innovation, they develop a more positive managerial attitude toward affordable innovation.

5.3 | Limitations and Future Research

While this research is an important step toward understanding the conditions under which managers promote or reject affordable innovation, it is not without limitations. First, we have only a small sample covering three different countries. To examine antecedents in more cultural contexts, studies in more countries would be needed. Future research should therefore focus on validating these findings in multiple countries, perhaps by measuring potential country-specific differences at the individual level. Second, decisions for or against new products and innovations are often based on team decisions, and team characteristics such as team identity influence innovation behaviour (Litchfield et al. 2018). In our study, we only measure individual managerial attitudes, and it would be relevant to examine the antecedents of team attitudes. For example, team composition could play an important role in team attitudes toward affordable innovation. Third, our study mainly focuses on affordable innovation in the form of new products. However, recent research shows that consumers at the bottom of the pyramid prefer access-based services because they have less ownership risk (Schaefer et al. 2021). Future research could therefore also explore whether the antecedents of innovators' attitudes toward affordable innovations depend on the type of affordable innovation and the customer group they target. Fourth, we had to exclude several items from the general innovativeness scale during the CFA, so our results only apply to the 'Willing to Try' sub-dimension of the general innovativeness scale (Goldsmith 1991). Since the items are reverse-coded, they reflect more of an 'Unwilling to Try' construct. Future research could therefore validate the results with other measurement instruments for our antecedents. Finally, our research focuses on the antecedents of managerial attitudes toward affordable innovation. We also show that this attitude translates into real behaviour (i.e., affordable innovation investment height), but further research is needed here on the various potentially dependent variables that are influenced by such an attitude (e.g., the selection of ideas for affordable innovation). In addition, attitude and behaviour may be reciprocally related. For example, recurrent decisions in favour of premium innovations might in turn influence managerial rejection attitudes of affordable innovations. Future research could explore this reciprocal behaviour in more detail. Overall, we believe that this study is an important step toward understanding the conditions under which firms promote or reject affordable innovations.

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Data Availability Statement

The data that support the findings of this study are openly available in Harvard Dataverse at <https://doi.org/10.7910/DVN/KPRVAE> [currently

as draft version available here: <https://dataverse.harvard.edu/privateurl.xhtml?token=fc777f67-9365-4d91-b550-a8eddc15480a>].

Endnotes

¹The terms affordable innovation and frugal innovation have many overlaps and share characteristics such as cost-effectiveness, high quality and robustness (Agarwal, Oehler, and Brem 2021). However, they can present two different perspectives on the same phenomenon, with frugal innovation emphasizing the product perspective (focus on core functionalities and a cost-constrained environment, Weyrauch and Herstatt (2017); Zeschky, Winterhalter, and Gassmann (2014)) and affordable innovation emphasizing the customer and market perspective (low willingness/ability to pay; Reinhardt, Gurtner, and Griffin (2018)). Moreover, affordable innovation is a broader term that may or may not include frugal characteristics such as resource constraints.

²Please note that additional analysis shows that the negative impact of general innovativeness on AIR attitude is indeed mainly determined by the sub-dimension 'Willing To Try' of the construct of general innovativeness, while the other sub-dimensions excluded for the main analysis show a positive or no correlation with AIR attitude.

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Appendix A

TABLE A1 | Constructs and scales.

Construct, Items
<p>Affordable innovation rejection attitude</p> <ol style="list-style-type: none"> 1. I am reluctant to new product ideas that target customers who prefer to pay only a minimum. 2. Working on ideas that targeted affordable products does not stimulate my creativity. 3. In the past, I could not identify with projects that were designed for customers with a low willingness to pay. 4. Offering low-priced products is not good for a company image. 5. Standard products with simple functionalities bore me. 6. I doubt that products for price-sensitive customers can achieve significant results. <p>Likert scale: 1 ... strongly disagree to 7 ... strongly agree</p> <p>Affordable innovation investment height</p> <p>Please put yourself in the shoes of a manager. Your team has developed two new innovation projects, which are outside the central scope of your company, but still present very interesting opportunities. Now it is up to you to decide how you would like to pursue the projects further in a company spin-off. Read the two project descriptions and make a decision how much you would like to invest in each.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>Affordable innovation 1: solar car Providing an environmentally friendly solution for the mobility needs of a growing population, this robust solar powered car addresses the large working class of developing countries. The car offers a basic but stylish interior and a 30-hp all-electric motor to enable safe and efficient travel. <i>expected total profits: \$ 12 million/year</i> <i>expected investment: \$ 30 million</i></p>  </div> <div style="width: 48%;"> <p>Premium innovation 1: electric luxury car This electric car is no ordinary sports car. Combining luxury amenities like leather and carbon interior, multimedia entertainment and assisted driving with an environmentally friendly electric engine with 300-hp, the car targets enthusiasts with high financial means and high demands for quality in developing countries such as China, Russia and the Middle East. <i>expected total profits: \$ 12 million/year</i> <i>expected investment: \$ 30 million</i></p>  </div> </div> <p>You have 10 Million US-Dollar as a first investment. Please decide how you would split this budget between the two innovation projects. Please round to whole numbers. Solar car: ___ Electric luxury car: ___ If you would have to decide to invest in only one project, which one would you select? Solar car, Electric luxury car</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>Affordable innovation 2: rugged economical eye screening system</p> <p>Current diagnostic devices are expensive and screening requires a single device for every problem. This new screening system can diagnose multiple eye problems simultaneously. It is low cost, portable and highly integrated, and therefore can easily be transported to poor rural communities of developing countries for a temporary eye-check clinic. The device does not require high skilled physicians but instead provides an automated 'OK' or 'Need to See a Doctor' output. <i>expected total profits: \$ 1.5 million/year</i> <i>expected investment: \$ 8 million</i></p>  </div> <div style="width: 48%;"> <p>Premium innovation 2: new generation LASIK</p> <p>The third-generation LASIK operation equipment provides a micro-invasive laser vision correction method using state-of-the-art laser technology. The refractive correction of vision defects using laser technology has established itself as a method to enable patients to have a life without glasses. The new technology involves the least possible intervention and reduces problems such as dry eye syndrome. The product addresses financially strong medical practices in the US, Europe and Asia. <i>expected total profits: \$ 1.5 million/year</i> <i>expected investment: \$ 8 million</i></p>  </div> </div>

(Continues)

TABLE A1 | (Continued)

Construct, Items
<p>You have 10 Million US-Dollar as a first investment. Please decide how you would split this budget between the two innovation projects. Please round to whole numbers. Rugged Economical Eye Screening System: ____ New Generation LASIK: ____ If you would have to decide to invest in only one project, which one would you select? Rugged Economical Eye Screening System, New Generation LASIK</p>
<p>Technological innovativeness</p> <ol style="list-style-type: none"> 1. I get a kick out of buying new high tech items before most other people know they exist. 2. It is cool to be the first to own new high tech products. 3. I get a thrill out of being the first to purchase a high technology item. 4. Being the first to buy new technological devices is very important to me. 5. I want to own the newest technological products. <p>Likert scale: 1 ... strongly disagree to 7 ... strongly agree</p>
<p>General innovativeness</p> <ol style="list-style-type: none"> 1. My peers often ask me for advice or information. 2. I enjoy trying out new ideas. 3. I seek out new ways to do things. 4. I am generally cautious about accepting new ideas. (R) 5. I frequently improvise methods for solving a problem when an answer is not apparent. 6. I am suspicious of new inventions and new ways of thinking. (R) 7. I rarely trust new ideas until I can see whether the vast majority of people around me accept them. (R) 8. I feel that I am an influential member of my peer group. 9. I consider myself to be creative and original in my thinking and behaviour. 10. I am aware that I am usually one of the last people in my group to accept something new. (R) 11. I am an inventive kind of person. 12. I enjoy taking part in the leadership responsibilities of the groups I belong to. 13. I am reluctant about adopting new ways of doing things until I see them working for people around me.(R) 14. I find it stimulating to be original in my thinking and behaviour. 15. I tend to feel that the old way of living and doing things is the best way. (R) 16. I am challenged by ambiguities and unsolved problems. 17. I must see other people using new innovations before I will consider them. (R) 18. I am receptive to new ideas. 19. I am challenged by unanswered questions. 20. I often find myself sceptical of new ideas. (R) <p>Likert scale: 1 ... strongly disagree to 7 ... strongly agree</p>
<p>Firm resources for innovation</p> <ol style="list-style-type: none"> 1. We have sufficient access to human resources to be innovative. 2. We have sufficient access to financial resources to be innovative. 3. We have sufficient access to physical resources to be innovative. <p>Likert scale: 1 ... strongly disagree to 7 ... strongly agree</p>
<p>Product positioning strategy</p>

(Continues)

TABLE A1 | (Continued)

Construct, Items
<p>Please indicate the product positioning strategy your firm is mainly following. The left side indicates an affordable innovation strategy (i.e., new products are usually positioned below the average market price of a product category) and the right side indicates a premium innovation strategy (i.e., new products are usually positioned above the average market price of a product category). Select on the slider the value on how strong you feel your company follows the one or the other strategy.</p> <p>–5 ... Affordable Innovation Strategy to +5 ... Premium Innovation Strategy</p> <p>Ecological perception</p> <p>Please indicate which of the two innovation types (affordable innovation or premium innovation) you perceive as more ecological (i.e., benefiting the environment). Please use the slider to indicate which of the two types you find more ecological. The further you shift the slider to the one or the other side, the stronger you believe this innovation type to be more ecological.</p> <p>–5 ... Affordable Innovation to +5 ... Premium Innovation</p> <p>Social perception</p> <p>Please indicate which of the two innovation types (affordable innovation or premium innovation) you perceive as more social (i.e., benefiting communities and society). Please use the slider to indicate which of the two types you find more social. The further you shift the slider to the one or the other side, the stronger you believe this innovation type to be more social.</p> <p>–5 ... Affordable Innovation to +5 ... Premium Innovation</p> <p>Age</p> <p>How old are you?</p> <p>Gender</p> <p>Please select your gender: (1) female, (2) male, (3) other</p> <p>We built the binary variable (2) female, (1) else for analysis.</p> <p>Number of NPD projects</p> <p>Please indicate the number of product development projects you have already been involved in.</p> <p>Years of work experience in NPD</p> <p>Please indicate how many years of work experience you have in new product development.</p> <p>Years living abroad</p> <p>How many years have you spend living abroad, if any?</p> <p>Degree</p> <p>Please indicate your highest degree. (1) No degree, (2) Secondary/Middle School, (3) High School, (4) Vocational apprenticeship, (5) Bachelor degree, (6) Master degree, (7) PhD/Doctorate</p> <p>Income</p> <p>Please indicate your personal monthly income category (after taxes). (0) Below 250 USD^a, (1) 250–500 USD, (2) 500–999 USD, (3) 1.000–1.999 USD, (4) 2.000–2.999 USD, (5) 3.000–3.999 USD, (6) 4.000–4.999 USD, (7) 5.000–5.999 USD, (8) 6.000–6.999 USD, (9) 7.000–7.999 USD, (10) 8.000–8.999 USD, (11) 9.000–9.999 USD, (12) Equal or above 10.000 USD</p> <p>Religion</p> <p>Please indicate your religious confession. (1) Catholic, (2) Evangelic/protestant, (3) Orthodox, (4) Muslim, (5) Jewish, (6) Buddhist, (7) Hindu, (8) Atheist, (9) Spiritual, (10) Dutch Reformed churches^a, (11) Zion Christian churches^a, (12) Pentecostal/Charismatic churches^a, (13) Methodist churches^a, (14) Other</p> <p>We built the binary variable religiousness (1) religious, (0) atheist for analysis.</p> <p>Firm age</p> <p>Please indicate the age of the firm you work for (in years).</p> <p>Number of firm employees</p> <p>Please indicate the number of your firm's employees.</p> <p>Industry</p>

(Continues)

TABLE A1 | (Continued)

Construct, Items
Please indicate the industry in which your firm is mainly positioned. Accommodation, Activities auxiliary to financial services and insurance activities, Activities of extraterritorial organizations, Activities of head offices; management consultancy activities, Activities of households as employers and producers, Administrative and support service activities, Agriculture, forestry and fishing, Architectural and engineering activities, Arts, entertainment and recreation, Construction of buildings and Civil engineering, Education, Electricity, gas, steam and air-conditioning supply, Employment activities, Financial service activities, Food and beverage service activities, Human health activities, Insurance, IT and other information services, Land transport and transport via pipelines, Legal and accounting activities, Manufacture of coke, chemicals and chemical products, Manufacture of computer, electronic and optical products; watches and clocks, Manufacture of electrical equipment, Manufacture of food and tobacco products, Manufacture of machinery and equipment n.e.c., Manufacture of metal products, Manufacture of pharmaceutical products, Manufacture of rubber and plastics products, Manufacture of textiles and apparel, Manufacture of transport equipment, Manufacture of wood and paper products, and printing, Mining and quarrying, Other manufacturing, repair and installation, Other professional, scientific and technical activities, Other service activities, Postal and courier activities, Public administration, Publishing, audiovisual and broadcasting activities, Real estate activities, Residential care activities, Retail trade, Scientific research and development, Social work activities without accommodation, Specialized construction activities, Telecommunications, Trade and repair of motor vehicles and motorcycles, Warehousing and support activities for transportation, Water supply, waste management, Water transport and Air transport, Wholesale trade
The three most frequently mentioned industries have been selected as control variables.

^aThese answers was not presented in the German and USA survey version. An 'R' in brackets behind an item means reverse coded.

TABLE A2 | Measurement invariance.

Model	Chi ²	df	Chi ² /df	delta Chi ²	delta df	p	CFI	Delta CFI
Free	866.18	609	1.42	—	—	—	0.926	—
Metric	949.09	653	1.45	82.91	44	0.0004	0.915	0.011
Scalar	1110.36	697	1.59	161.27	44	0	0.881	0.034
Strict	1168.27	725	1.61	57.91	28	0.0007	0.872	0.009

TABLE A3 | Replication of SEM results with (moderated) mediation regression analysis.

Path	SEM (version in the paper)				Mediated regression analysis (Relation indicated: X AIR, Indirect effect: X AIR AI Investment Height)		
	Main SEM	Germany	USA	South Africa	(1) Without controls	(2) With covariates	(3) With moderation of X AIR
Technological innovativeness → AIR	0.250** H_1 : ✓	0.329**	0.357**	0.158	0.322** [Ind. E.: -0.103*] H_1 : ✓	0.173** [Ind. E.: -0.057*] H_1 : ✓	Ind. E. sign. For GER* and USA* ✓
General innovativeness → AIR	-0.323** H_2 : ✓	-0.187 [†]	-0.501**	-0.258*	-0.364** [Ind. E.: 0.136*] H_2 : ✓	-0.265** [Ind. E.: 0.087*] H_2 : ✓	Ind. E. sign. For USA* and SAF [†] ✓
Firm resources for innovation → AIR	-0.048 H_3 : ✗	-0.041	-0.039	-0.075	0.166** [Ind. E.: -0.070*] H_3 : ✓	-0.052 [Ind. E.: -0.017] H_3 : ✗	Ind. E. not sign. ✓
Product positioning strategy (affordable vs. premium str.) → AIR	0.109** H_4 : ✓	0.088	0.387**	0.152	0.164** [Ind. E.: -0.071*] H_4 : ✓	0.076** [Ind. E.: -0.025*] H_4 : ✓	Ind. E. sign. For USA* ✓
Ecological perception (affordable vs. premium P.) → AIR	0.153** H_5 : ✓	0.137	-0.109*	0.374**	0.142** [Ind. E.: -0.053*] H_5 : ✓	0.056* [Ind. E.: -0.018 [†]] H_5 : (</)	Ind. E. sign. For SAF [†] (</)
Social perception (affordable vs. premium P.) → AIR	0.122* H_6 : ✓	0.195	0.188*	0.104	0.134** [Ind. E.: -0.046*] H_6 : ✓	0.036 [†] [Ind. E.: -0.012] H_6 : (</) [Direct E. is significant!]	Ind. E. not sign. For all countries ✗
AIR → AI Invest. Height	-0.213** H_7 : ✓	-0.143**	-0.214**	-0.175**	H_7 : ✓ (for all models)	H_7 : ✓ (for all models)	No moderation path specified

Note: For Mediation analysis indirect effects: * bootstrapping confidence interval 95%, [†] bootstrapping confidence interval 90%. Covariates refers to all control variables and all other hypotheses variables.

For SEM:

** $p < 0.01$, * $p < 0.05$, and [†] $p < 0.10$.