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The role of consumer characteristics in explaining product innovation performance: Evidence from emerging economies

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Abstract

Building on evolutionary perspectives, we offer a new demand-based explanation as to why the product innovation performance of firms varies across countries. We propose that certain *consumer characteristics* (namely, buyer sophistication, creativity, global identity and local identity) influence firms' product innovation performance by a) affecting the creation and success of innovative products and b) strengthening (positively moderating) the effects that a firms' R&D has on its product innovation performance. The analysis of 48,176 firm-level observations from 49 emerging economies in Central and Eastern Europe, Central Asia and Africa confirms most of the above predictions. The study complements prior perspectives on innovation performance, which largely focus either on the firm or its industry, by explaining the mechanisms through which consumer characteristics influence firms' innovation performance, identifying which consumer characteristics matter, and advancing a demand-based perspective that has not attracted sufficient attention in the literature.

Keywords: Innovation performance; evolutionary theory; national innovation systems; consumer characteristics; emerging economies.

1. Introduction

The innovation literature has focused on two key theoretical lenses to explain why some firms are more innovative than others. The first lens considers how the internal resources and capabilities of firms help them become more innovative (Ayyagari et al., 2011; Galende and de la Fuente, 2003; Lee et al., 2019; Ren et al., 2015), whereas the second lens focuses on the firm's context and environment (Gorodnichenko et al., 2010; Xie and Li, 2018). Although market-pull and demand-specific forces may motivate firms to innovate (Mowery and Rosenberg, 1979; Nemet, 2009), prior studies (including those on national innovation systems) have paid little attention to the role of consumers and, more importantly, how their characteristics affect demand conditions and in turn firms' innovation performance.

Only a few innovation studies have recently started considering the role of demand (Ye and Mukhopadhyay, 2013; Nambisan and Zahra, 2016; Sohl, Vroom, and McCann, 2020; Priem et al., 2012). For example, Nambisan and Somaya (2013) focus on entrepreneurs' ability to capture and understand market demand, while other studies focus on the role of clients and on how they may lead diversification (Mawdsley and Somaya, 2018). Prior research has also examined how firms respond to feedback from the market (Boettke and Candela, 2014; Hayek, 1945), emphasizing the role of market awareness for a firm (Bonney et al., 2016; Kirzner, 1997; Maynard et al., 2020) or the role of firm capabilities such as customer orientation (e.g., Zhou and Li, 2010) and market orientation (Acikdilli et al., 2020; Hunt and Morgan, 1995).[1] Overall, prior studies have examined internal firm capabilities and market intermediaries (e.g., Bounie, Dubus, and Waelbroeck, 2021; Giménez Roche and Calcei, 2021) and how well firms understand the

[1] Market orientation is conceptualized in the literature based on the resource-advantage theoretical view. It reflects firms' knowledge about market characteristics which can help firms develop marketing capabilities and, in turn, contribute to firms' competitive advantage (Acikdilli et al., 2020; Hunt and Morgan, 1995).

preferences of consumers, but have not focused on consumer characteristics *per se*. This limitation is surprising given that the success of innovation in each country largely depends on how well it is received by its consumers.

Although extant research has considered how consumers (or users) with specialized knowledge directly contribute to the innovation process (Bogers et al., 2010; Morrison et al., 2000; Nambisan, 2002), it has not considered how certain characteristics of consumers matter in shaping market demand and in turn firm innovativeness. To address this limitation in our understanding, we draw on the evolutionary perspective (Nelson and Winter, 1982; Simonton, 1999; Singh and Fleming, 2010) to conceptualize how certain qualities of consumers shape firm innovativeness across different countries. In line with other demand-side perspectives (Adner and Levinthal, 2001), we have chosen to draw on the evolutionary perspective (Nelson and Winter, 1982; Ruttan, 1997) because of its emphasis on explaining innovation as an outcome of interactions between different types of agents in the market (Hayek, 1945; Schumpeter, 1942). As our study considers how firm innovation is driven by consumer characteristics, the evolutionary approach provides a useful theoretical framework for investigating this relationship. Prices and the development of trends in a market are driven not only by firms, but also by consumers' valuation of products (Hayek, 1945; Stefano et al, 2012). Although the decision to innovate is made by each firm, the process of innovation assigns an inherent role to consumers (Hayek, 1945; Schumpeter, 1942; Rubera et al., 2011). Hence, a firm may anticipate certain preferences, but whether new products will be accepted by the market is largely a matter of consumers' selection.

Our study focuses on the context of emerging economies. Prior research has considered various differences, such as internationalization (Samant, Thakur-Wernz, and Harfield, 2021) and environmental conditions (Crespi, Katz, and Olivari, 2017), but demand conditions have attracted

less attention. Consumers in such economies are less affluent compared to their counterparts in developed countries. This difference affects needs and purchasing decisions (McMullen and Bergman, 2018) and therefore innovation performance. In addition, as emerging economies place emphasis on societal needs (Reynoso et al., 2015), innovative products in such contexts must be closely aligned with consumer characteristics. For those reasons, it is important to consider how certain consumer characteristics in emerging economies shape demand for innovative products and in turn influence firms' innovation performance.

Focusing on the demand side, our study examines how the following four dimensions of consumer characteristics influence evolutionary processes and in turn a firm's innovation performance: *buyer sophistication*, *creativity*, *global identity* and *local identity*. As discussed in the next sections, the choice of these characteristics is driven by the need to capture constructs that reflect consumers' inclination to value and adopt innovative products. We expect firms' innovation performance to vary across countries depending on consumer characteristics because they shape the nature of demand in the market in a way that may (or may not) favor the introduction and success of innovative products. We further propose that consumer characteristics have an *indirect* impact, moderating the effectiveness of firms' R&D on their innovation performance. It has long been established that R&D advances innovation and accordingly governments often introduce policy incentives. Although our analysis is consistent with the view that R&D is critical (Kafouros et al., 2018; Yam et al., 2004; Mavroudi et al., 2020), we argue that its effect on innovation performance can be weakened or strengthened by certain consumer characteristics. As such, its effect can be weak in some markets, but increase considerably in other markets.

We test our framework using firm-level innovation performance data from 49 emerging economies and information about consumer characteristics. The findings show that these

dimensions of consumer characteristics (buyer sophistication, creativity, global identity, and local identity) are positively associated with firms' product innovation performance. They also show that these consumer characteristics (except buyer sophistication) moderate the effect of a firm's own R&D on its innovation performance. Hence, consumer predisposition toward innovation not only 'pulls' innovation but also strengthens the relationship between a firm's investment in innovation and its innovation performance. By integrating the role of an important demand-specific condition (consumer characteristics), the study complements prior theoretical lenses that largely focus on firm resources and industry competition. Thus, it offers a new complementary explanation as to why firms' innovation performance varies across emerging economies.

2. Conceptual framework and hypotheses development

2.1. Demand-specific considerations in national innovation systems

The framework of national innovation systems (NIS) helps us understand the drivers of innovation beyond a firm's own capabilities and the direct network of firms such as industry (Nelson, 1993). It accordingly focuses on research organizations, institutions, and governments that constitute the external environment (Guan and Chen, 2012) and how firms adapt to changes in technologies and social environments in an evolutionary process (Nelson and Nelson, 2002). Although the literature recognizes that demand is critical for the competitiveness of an industry (Porter, 1990), research on NIS does not explicitly specify the role of demand characteristics (Carlsson et al., 2002) and many studies have focused only on how policy and institutions influence demand indirectly (Edler, 2011; Edquist and Hommen, 1999; Guan and Chen, 2012).

Although product innovation success depends on consumers' response to innovative products (Hauser et al., 2006), demand-specific conditions have not attracted a lot of attention. In prior research, only income level has been considered as a demand indicator (Belitz et al., 2011),

but this captures the level of demand without reflecting specific consumer characteristics, such as their appreciation of innovative products and to what extent they are inclined to buy and use them. While previous research has examined contextual aspects of the surrounding conditions in a society such as whether the societal climate supports innovation (e.g., willingness to take risks) (Marxt and Brunner, 2013), the social sentiment is too broad to capture demand-specific characteristics in relation to understanding, liking, and using innovative products in the market.

Beyond the NIS literature, previous research has examined how some consumer characteristics are related to firm innovation, but the investigation of consumer characteristics is limited to the narrow scope such as cluster-level characteristics (e.g., density and regional heterogeneity) of consumers (Bindroo et al., 2012) or the high-level contextual factors such as Hofstede cultural dimensions (Becheikh et al., 2006). Both however are only remotely related to the demand for innovative products, as cultural dimensions, such as power distance and time orientation, do not exhibit strong relationships with innovation (Becheikh et al., 2006; Morris et al., 1993; Rhyne et al., 2002; Shane, 1993). Hence, despite prior calls about the role of markets (Vargo et al., 2017), there is still lack of research on how consumer characteristics shape demand for innovation.

2.2. Consumer characteristics that shape market demand for innovative products

Consumer characteristics related to their demand for innovative products in a country include various aspects that contribute to the propensity to appreciate and adopt a new product (Tellis et al., 2009). We identify consumer characteristics that are strongly related to the degree of consumers' understanding of and their liking for selecting innovative products. Previous research on consumers has evolved around the measurement of how to capture individuals who favor innovative products (Im et al., 2003; Midgley and Dowling, 1978), cultural (e.g., uncertainty avoidance) and socio-demographic antecedents (e.g., age, income, education,

religion) of consumers' preferences for innovation (Bartels and Reinders, 2011; Herbig, 1998; Herbig and Day, 1992; Mansori, Sambasivan, and Md-Sidin, 2015; Singh, 2006; Steenkamp et al., 1999), and behavioral outcomes of such consumers in terms of adoption of new products (Steenkamp and Baumgartner, 1992). Yet, while significant national variations exist in consumers' tendency to favor innovativeness (Hauser et al., 2006), little research has examined whether demand (as shaped by consumer characteristics) can be a condition facilitating firm-level innovation.

We identify four consumer characteristics that are related to the demand of innovative products: buyer sophistication, creativity, global identity, and local identity.[2] Based on insights obtained from relevant literature on consumer characteristics and innovation, we choose these consumer characteristics using two key criteria. First, we identify consumer characteristics that (based on theory and prior literature on consumer characteristics that are relevant to innovation) are directly indicative of the adoption and selection of innovation. Second, given that the research design of our study required us to cover many countries (to have sufficient cross-country variation), our choice was also constrained by data availability.

Buyer sophistication refers to "the ability to understand innovations and use them" (Allman et al., 2011). Buyer sophistication has been studied in a large-scale international research project, which is part of the Global Competitiveness Index (Schwab, 2017).[3] Buyer sophistication is an indicator of technology awareness as sophisticated consumers are adept at knowing and comprehending technology and innovation (Mahroum and Al-Saleh, 2013; Porter, 1990) due to

[2] These four dimensions of consumer characteristics are not an exhaustive list. These dimensions are selected for their theoretical relevance and importance to consumers' innovation demand. Identifying a comprehensive list of consumer characteristics is beyond the scope of this study.

[3] It is measured with a question "Buyers in your country make purchasing decisions" (1 = 'based on solely on the lowest price'; 7 = 'based on a sophisticated analysis of performance attributes').

their high human capital in terms of skills, performance, and education (Hollanders and Arundel, 2007). It is also used as an indicator of market demand for innovation as only sophisticated buyers appreciate innovative products (Barnes and McTavish, 1983; Hall and Jaffe, 2012). On the contrary, consumers with low levels of sophistication are less aware of technological novelty, and this makes them more easily satisfied with what they are used to and avoid change.

Consumer creativity refers to "the problem solving capability possessed by the individual that may be applied toward solving consumption-related problems" (Hirschman, 1980). While buyer sophistication primarily refers to the ability of consumers in terms of their capacity to discern the value of innovative products (Allman et al., 2011), creative consumers are equipped with both the ability and the attitude related to creativity and innovation. Creative consumers not only can effectively understand and use new products (Hirschman, 1983), but also are motivated to find novel and useful solutions for their consumption-related problems (Burroughs and Mick, 2004). Hence, consumers in markets with high creativity tend to adopt new products and even spur innovation (Hirschman, 1980; Morrison et al., 2000). Consumers with lower levels of creativity would be more inclined towards pre-established solutions and find the new solutions burdensome to adopt. If consumer creativity in the market influences the structure of the demand in the market, creativity variations across countries are particularly important (Liu et al., 2018; Rinne et al., 2013; Rojenko and Dahs, 2017).

In addition to *buyer sophistication* and *consumer creativity*, the following two dimensions of consumer characteristics – *global identity* and *local identity* – relate to the favorable attitudes toward innovative products based on social identification. According to the social identity theory, social identity reflects the social group a person defines oneself to be part of and therefore guides behavior in a way that keeps the desired social identification (Tajfel and Turner, 1992). As a result, people make consumption decisions that reflect their desired social identity (Reed, 2002).

This suggests that consumers' demand for innovative products would depend on how congruent these products are with their desired social identification.

Regarding a *global identity*, individuals with a global (cosmopolitan) identity are those who consider themselves as citizens of the world; open to other cultures and think themselves beyond the national membership (Hill, 1998). They are also aware of information regarding the global culture and are willing to communicate with people from other cultural or regional backgrounds (Arnett, 2002). Due to openness of such consumers to other cultures and receptivity to global trends, they have a tendency to opt in favor of new and innovative products (Riefler et al., 2012). In contrast, consumers with low levels of global identity are less conscious of international society and place less emphasis on global community in defining their identity.

Lastly, consumers may consider themselves as part of a local community (Venaik and Midgley, 2015), which reflects their local identity. *Local identity* is defined as "consumers' identification and respect for local customs and traditions" (He and Wang, 2017). Unlike ethnocentrism, local identity can coexist with global identity (Cleveland et al., 2011; Greenaway et al., 2015). Since local identity reflects knowledge of local culture (Guo, 2013), interest in local events, and motivation to preserve local traditions and values based on their recognition of local uniqueness (Arnett, 2002), consumers who have a strong local identity appreciate locally relevant products (Heinberg et al., 2016; Zhang and Khare, 2009). As a result, innovations that meet the unique needs rooted in locally relevant values and environment can be attractive to the consumer base with a strong local identity. In contrast, consumers that lack local identity place less emphasis on local values and traditions in defining their identity.

2.3. Consumer characteristics and firm's product innovation performance

Product innovation refers to the process of creating and introducing new products to the market (Hauser et al., 2006). There are various determinants of product innovation. These can

categorized into factors related to a firm's internal resources (e.g., technological competence, Vega-Jurado et al., 2008), industry environment (e.g., technological opportunities and appropriate conditions, Vega-Jurado et al., 2008; industry competition, Rammer and Schubert, 2018), regional resources (Rodríguez-Gulías et al., 2021), and variations in culture (Rhyne et al., 2002). However, research on the demand-side of product innovation has remained scant.

Building on evolutionary perspectives (Campbell, 1960; Consoli, 2005), we argue that consumer characteristics affect firms' innovation performance by influencing the process of variation-selection-retention (VSR) in the market (Aldrich, 1999, 2008). The structure of consumer preferences in an economy shapes the demand for innovative products in the market and signals their choices via the price system (Hayek, 1945). In emerging markets, indigenous innovation solutions are developed to cater for the needs of consumers with resource constraints (Reynoso et al., 2015), which suggest that consumer characteristics can increase the success and survival chances of the local firms' innovative solutions.

Accordingly, firms with better market awareness or market orientation can achieve better performance (Acikdilli et al., 2020; Bonney et al., 2016; Hunt and Morgan, 1995). Similarly, from a demand point of view, consumers who prefer innovative products tend to acquire more products and adopt innovative products without resistance (Midgley and Dowling, 1978). This view suggests that they actively reward firms supplying innovative products via purchase.

First, in terms of *buyer sophistication,* in countries where consumers have higher sophistication, they would be able to understand and appreciate the novelty and associated benefits of innovative products (Barnes and McTavish, 1983; Mahroum and Al-Saleh, 2013). Across the evolutionary paths, this sophisticated consumer base would create the demand structure that supports and favors proliferation of innovative products, and further selectively purchase them. Due to the ability of sophisticated consumers to learn novel functions, they would

adapt to the new features of novel products more easily. In summary, a sophisticated consumer base can facilitate selective retention of more innovative products in the market.

Second, *creative consumers* are able to evaluate novelty and innovativeness of products (Hirschman, 1980) due to their knowledge, abilities, and motivation to look for novel solutions to address their consumption needs (Burroughs and Mick, 2004; Hirschman, 1983). Hence, more creative consumers would spur demand for innovative products and influence the demand structure by opting for products that offer novel solutions to the existing problems. In other words, innovative products are more likely to be selected in countries where consumers are creative, than in countries where consumers are less creative.

Third, consumers' social identification as a *global citizen* manifests their openness to different cultures and countries (Hill, 1998) as well as to unfamiliar novel products and ideas (Riefler et al., 2012; Nie et al., 2021). Hence, open-minded consumers contribute to the filtering of products and services streamlined with global trends. Consequently, selection of *global citizens* likely mirrors technological progress and lifestyle in more technologically advanced and affluent countries (Riefler et al., 2012). This will result in higher acceptance of innovative products. Similarly, a customer base consisting of *global citizens* who try the selected novel products will likely drive their retention, sustaining the sales of innovative products. In summary, consumers with strong identification as global citizens will stimulate firm innovation performance by opting for innovative products more intensively.

Lastly, consumers who have a strong *local identity* appreciate products that meet local preferences and needs from their lifestyle and culture (Zhang and Antonio, 2005). As a result, local firms can enjoy consumer support towards local innovation (Agarwal and Brem, 2012). Consumers with strong local identity derive satisfaction not only from product novelty, but also from the local-specific nature of the novelty of the product. Moreover, while innovative products

tend to charge a higher price compared to alternatives (Varadarajan, 2009), consumers with a strong local identity would be likely to accept local versions of innovative products even with a price premium (Gao et al., 2017).

In sum, we expect the above dimensions of consumer characteristics to have positive impact on the innovation performance of firms. Hence:

> **Hypotheses 1a, b, c, d:** The higher is the level of **a)** buyer sophistication, **b)** consumer creativity, **c)** global identity and **d)** local identity in a given market, the stronger the innovation performance of firms will be.

2.4. The moderating role of consumer characteristics in the relationship between R&D and innovation performance

R&D is a key source of firm innovation (Kafouros and Buckley, 2008; Raymond and St-Pierre, 2010) that enhances firms' innovation activities (Stokey, 1995) and market performance (Ettlie, 1998). The effectiveness of R&D in enhancing innovation has been documented in emerging economies (Gui-long et al., 2017; Khan, Lew, and Marinova, 2019), and occurs through improving firms' learning and absorptive capacity (Deeds, 2001). Accordingly, policy makers in emerging economies tend to provide government support for R&D (Adomako et al., 2020). However, beyond the established view that R&D positively affects innovation, we argue that the effectiveness of R&D in enhancing innovation performance is contingent on consumer characteristics. This is a salient point as R&D might not come to its fullest fruition without the appropriate demand-side conditions (that are often driven by consumers' characteristics).

Firms invest in R&D to produce innovative products but effectiveness of such efforts can depend on the support of the market (Priem et al., 2012). According to the co-evolutionary perspective, firms' decisions to use their resources do not have a standalone effect, but depend on

their surrounding environment (Lewin et al., 1999). However, in the emerging economy contexts, where resources are scarce and thus efficient integration and management is essential, the contribution of consumers to innovation processes is critical (Reynoso et al., 2015). As environmental selection occurs via the cognitive norms dominant in the environment (Aldrich, 1999), consumers that are favorable to innovative products serve as an environmental support for innovation. Hence, R&D might be less effective in some markets (Mavroudi et al., 2020), particularly when the market lacks certain consumer characteristics. Accordingly, we expect that consumer traits related to their tendency to appreciate and value innovation will strengthen the effects of R&D on innovation performance.

Specifically, as *sophisticated consumers* exhibit a favorable attitude towards more technologically advanced products (Ahmed et al., 2002), highly sophisticated consumers are more likely to appreciate the technological advances that come from R&D, leading to innovation friendly selective retention. On the contrary, when R&D outputs are offered to markets lacking buyer sophistication, such technological advances are more likely go unnoticed or be less appreciated. They can therefore constrain the effects of R&D or even backfire if the consumers perceive the new features as a burden or refuse to accept them for other reasons.

Furthermore, *creative consumers* are well equipped with knowledge and skills in processing information (Hirschman, 1983). They are also willing to find novel and effective ways to solve problems (Burroughs and Mick, 2004). Thus, creative solutions that result from R&D would be more readily appreciated in markets with creative consumers than in markets where consumers are indifferent to creativity. New products also imply corresponding changes in the related products or activities (e.g., low-cost electric scooters may require frequent charging). While creative consumers are more likely to adapt to such changes, less creative consumers may

see these changes as a burden. The new products that firms create through R&D will be less successful when they are introduced in markets with low levels of consumer creativity.

Similarly, we expect that the effects of R&D on firms' innovation performance will be stronger when they operate in countries in which consumers identify themselves as part of a global or local community. First, although R&D results in new or refined products and services, the openness of consumers with a global identity means that they have better perceptions for firms that contribute to progress that is congruent with global trends and lifestyles (Nie et al., 2021). Catching the "global drift" in technological progress can give a sense of "fit" into international trends, resonating with the consumers' identification as global citizens. In contrast, in markets where consumers have lower levels of global identity, there is less desire to fit into international society and firms' R&D efforts have higher chance of being ignored.

Second, innovative products should be tailored to meet the locally unique needs and values of the market with a strong local identity. While it is difficult to address the unique needs (Agarwal and Brem, 2012), R&D activities can help firms to respond to the market demand promptly. R&D by local firms in emerging markets helps the firms adapt the novel trends to local needs (Choung et al., 2014). Such local variations of technological trends created by local R&D will likely be more appreciated by consumers who place stronger emphasis on local society in defining their social identity. In contrast, where local values play little role in the consumers' social identity, they may see little value in the locally reworked version of the novelty.

In sum, given that the four dimensions of consumer characteristics shape market demand for the products that firms develop through their R&D, we expect the relationship between a firm's R&D and its innovation performance to vary across countries that exhibit different consumer characteristics. This logic in turn leads to the following hypotheses:

Hypotheses 2a, b, c, d: The higher the level of **a)** buyer sophistication, **b)** consumer creativity, **c)** global identity and **d)** local identity in a given market is, the greater the effects of R&D efforts on the innovation performance of firms will be.

3. Methods and Sample

We examine innovation performance data of individual firms from a number of emerging economies from Central and Eastern Europe (CEE), Central Asia, and Africa. Although in emerging economies consumers typically have relatively weaker economic power than their counterparts in developed economies, studies show that demand for innovation may vary significantly (Edler, 2011). Such variation creates a platform to examine whether the proposed consumer characteristics contribute to firm innovation performance.

3.1. Sample

To construct the estimation sample, we used the Enterprise Surveys (ES) run by the World Bank Group (WB) and its partner organizations (http://www.enterprisesurveys.org). It is a firm-level survey of a representative sample of an economy's private sector. The survey is answered by business owners and top managers. Enterprise Surveys consists of multiple modules, and our targets were the modules with innovation-related questions. The first part of our data comes from the Business Environment and Enterprise Performance Survey (BEEPS). It was conducted by the European Bank for Reconstruction and Development (EBRD) for the transition economies covered by the bank in partnership with the WB Enterprise Surveys. BEEPS was run as part of Enterprise Surveys, but the survey is more detailed in the innovation related questions. BEEPS covered 31 countries. In addition, we collected Enterprise Surveys data for countries where the Innovation Module was run, which added 18 more countries. In total, from 49 economies, the sample included 48,176 valid observations across five time periods of data

collection (in 2007, 2010, 2011, 2012, and 2014). We included the largest possible number of countries to maximize cross-country variation in the data[4]. To obtain country-level consumer characteristics, the multiple data sources were sought as to be introduced below.

ES consists of pooled cross-sectional data, where firms are surveyed across several years.[5] Collection of responses is based on stratified sampling: population units are grouped within homogenous groups and sampled randomly within each group. The strata for the survey include firm size, business sector, and geographic region within a country. The sampling weights represent varying probabilities of selection across different strata.[6] Table 1 provides the sample size of the observations by country as well as information on the represented population and corresponding subsets (based on probability weights). In the baseline model (model 0), we used the full sample. However, when we introduce consumer characteristics variables in the analysis, values for a subset of countries are missing for each variable, which led us to use the sub-samples depending on availability of values of consumer characteristics variables. In estimating the models with sub-samples, we used survey estimation techniques to correctly adjust weights of the sub-samples resulting from missing observations[7].

[INSERT TABLE 1 ABOUT HERE]

3.2. Dependent variable: Innovation performance

To capture innovation performance, we used the answers to the question "In fiscal year [insert last complete fiscal year], what percentage of this establishment's total annual sales was accounted for by products/services that were introduced or significantly improved over the last

[4] To the best of our knowledge, our study is the first one to combine BEEPS with other country-specific ES innovation modules.
[5] Note that the dataset does not include repeat observations, hence does not qualify as panel data.
[6] Further details of the sampling procedure are available in https://www.enterprisesurveys.org/en/methodology
[7] In addition, we undertook the entire analysis with the smallest sub-sample in the data, making the number of observations consistent across the models. The results of this robustness test repeat the pattern of the main findings and are available at request. In the paper, we report the results with the largest possible sub-sample for each model.

three years? [BEEPS variable code: ECAo4]". Responses to the question represent each firm's proportion of new product (or service) sales in total sales to capture innovation performance following prior literature (Fosfuri and Tribó, 2008; He and Wong, 2004; Kostopoulos et al., 2011; Wang and Kafouros, 2009). Using this index based on surveys has become a popular way to capture innovation as it can overcome the limitations of using a single measure of innovation measure, e.g., patents (Becheikh et al., 2006). The value is measured in percentage points.

3.3. Independent variables: Measurement of country-level consumer characteristics

Consumers' sophistication is measured using *buyer sophistication* item that was collected by the World Economic Forum, Executive Opinion Survey in Global Competitiveness Report. The exact question for this item was "In your country, on what basis do buyers make purchasing decisions?" [1 = based solely on the lowest price; 7 = based on sophisticated performance attributes]. This variable reflects the quality of demand conditions together with the degree of customer orientation (Schwab, 2017). For all consumer characteristics variables, we use country average for the corresponding fiscal year of the respondent firm in the BEEPS/ES surveys.

Consumer creativity can be captured by the overall level of creativity of citizens in each country, measured by Global Creativity Index (Florida et al., 2015; Florida et al., 2011), which focuses on the contributions of creativity on economic growth as well as equality, human development and cultural openness. Three dimensions of creativity consist of the overall index: global technology index, global talent index, and global tolerance index. Thus, this measure can reflect the overall creativity of the market including consumers as well as employees. According to Hoelscher and Schubert (2015), the Global Creativity Index is highly correlated with indicators of innovation such as Global Innovation Index jointly developed by INSEAD Business School and World Intellectual Property Organization (correlation, Kendall's *Tau-b* = .686), and Innovation Union Scoreboard (correlation, Kendall's *Tau-b* = .641).

We measure consumers' global identity by the single item scale from the World Values Survey (V212 of the World Values Survey, "I see myself as a world citizen."). This identification as a world citizen is related to the degree of globalization (Pichler, 2012). From the same World Values Survey, we obtained a single item scale for consumers' identification with a local community (V213, "I see myself as part of my local community."). This item has been used as an indicator for one's local community identification (Greenaway et al., 2015).

3.4. Independent variables: Firm *R&D activity*

To measure firm's R&D activity we used the responses to the question "During the last three years, did this establishment spend on research and development activities, either in-house or contracted with other companies (outsourced)? [BEEPS variable code h6]". The survey records the responses as Yes/No. We created a dummy variable that takes the value of 1 for firms responding Yes.

3.5. Control variables

First, we controlled for firm-specific characteristics, including size (number of employees [L.1][8] in logs), age (in logs), share of foreign ownership [b2b], manager's experiences [b7] (years in logs), credit line availability [k8] and foreign technology licensing decision [e6]. Second, to control for country-specific differences that are not directly related to demand arising from the proposed consumer characteristics, we control for GDP per capita (in logs) and Rule of Law for the year corresponding to the financial year of each observation (Kaufmann et al., 2014). The former controls for the income level in the country to account for the level of income available to consumers in the market. The latter controls for legal institutions to account for cross-country variations in the quality of protection of property rights that may contribute to innovation

[8] Henceforth, BEEPS question/variable codes in square brackets.

performance. Next, we controlled for the country's international trade intensity (matching the year of each firm-level observation), by including imports and exports (calculated as the % shares of GDP) as control variables. Lastly, industry-specific and time-specific effects are controlled as fixed effects (dummy variables). We summarize the definitions of variables in Table 2.

[INSERT TABLE 2 ABOUT HERE]

3.6. Estimation procedure

The sampling weights in stratified survey designs take care of the varying probabilities of selection across different strata. As a result, each observation is assigned probability weight depending on the size of the strata it represents. A regular linear regression would result in downward biased standard errors as it assumes equal probability for each observation. To ensure correct modelling of the stratified survey data, we used estimation tools dedicated for survey data (Stata SVY commands). Linear estimations based on survey design allow us to specify probability weights of each observation assigned in the survey.

4. Results

Table 3 presents the descriptive statistics and correlations between variables. Tables 4 and Table 5 report the results of regressions. The separate analysis was conducted for each of consumer characteristics variables. Additionally, we conduct an analysis by using all consumer characteristics variables together in a single regression.

[INSERT TABLE 3 ABOUT HERE]

4.1. Effects of consumer characteristics

In Table 4, regressions in Models 2 – 5 test the effects of each type of consumer characteristics separately (H1). All proposed consumer characteristics are positively related to innovation performance. In Model 2, buyer sophistication is positively related to innovation (b =

1.737, $p < 0.01$). In Model 3, creativity is positively related to innovation ($b = 10.483$, $p < 0.001$). In Model 4, global identity is positively related to innovation ($b = 2.519$, $p < 0.01$) and in Model 5, local identity is positively related to innovation ($b = 5.136$, $p < 0.001$). These results support Hypothesis 1. In Model 6, when all these consumer characteristics are entered in the regression, all effects remain significant except the effect of local identity ($b = 2.158$; $p > 0.1$). The insignificant effect of local identity in Model 6 might be partly driven by the relatedness of the four consumer characteristics. The local identity variable is moderately correlated with creativity and global identity. Hence, when all the variables are included in a single model, the effects of consumer characteristics are likely to crowd out each other. In this instance, we can see that the marginal effect of local identity is down from 5.136 in Model 5 to 2.158 in Model 6, indicating that some of the effect of local identity is taken over by the effects of other consumer characteristics. Therefore, the interpretation of the results should take into account that although different consumer characteristics may vary conceptually, identifying their individual effects in the full model is affected by the relatedness among them. To this end, Models 2–5 should be more appropriate for testing the hypotheses.

[INSERT TABLE 4 ABOUT HERE]

4.2. Moderating effects of consumer characteristics in the relationship between R&D activity and innovation performance

Models 7 – 11 in Table 5 test whether consumer characteristics moderate the relationship between a firm's R&D and innovation performance. In Model 7, buyer sophistication does not significantly moderate the effect of R&D ($b = .574$, $p > 0.1$). However, in Model 8, creativity positively moderates the effect of R&D ($b = 19.275$, $p < 0.001$). In Model 9, global identity shows a statistically significant interaction with R&D ($b = 10.000$, $p < 0.001$). In Model 10, local identity shows a statistically significant interaction with R&D ($b = 5.591$, $p < 0.01$).

The finding that buyer sophistication did not moderate the effects of R&D on innovation performance is not consistent with our predictions. The results show that the influence of buyer sophistication in facilitating product innovation influences the consumers' choice of novel products and services directly, but does not moderate the effectiveness of R&D by local firms. In other words, all firms that conduct R&D benefit to the same extent, regardless of the level of buyer sophistication. A possible explanation is that R&D by firms in emerging economies creates sophistication in new products and services in small increments. As a result, consumers might not need to be sophisticated to be able to adapt to the novelty in new products and services, meaning that relative levels of buyer sophistication would not play a significant role in enhancing the benefits of R&D. Although this is a viable scenario, verifying the validity of this conjecture requires further research into the nature of R&D done by firms in emerging economies. Overall, except the level of buyer sophistication, these findings support Hypothesis 2 that consumer characteristics moderate the relationship between R&D and innovation performance.

In Model 11, when all the interaction terms are entered in the regression simultaneously, the interaction between global identity and R&D is statistically significant ($b = 5.45$, $p < 0.05$) but other interaction terms are not (ps > 0.1). We considered various explanations. First, in models with interaction effects, multiple entries of independent variables may lead to multicollinearity (Aiken et al., 1991). To investigate whether multicollinearity is influencing the results, we checked Variance Inflation Factors (VIFs) for model 11. While none of the direct effects had VIFs exceeding the critical value of 10 (Myers, 1990), the VIFs for the interaction terms exceeded the critical value. To investigate the impact of this issue on our findings we undertook a residual centering for the interaction terms (Aiken et al., 1991).[9] After applying this

[9] The technique involves multiple steps. The first step multiplies the two variables in the interaction (x_z=x*z). Second, the new variable is regressed against the components (i.e., x_z is regressed against x and z), and residuals

technique, the VIF values for all the interaction terms decreased below the critical value. We re-estimated Models 7 – 11 with residual centered interactions. However, the statistical significance pattern remained unchanged. This exercise shows that, multicollinearity does not pose threat to the analysis. At the same time, it confirms that the full Model 11 (given it does not change as an outcome of reducing multicollinearity), is unable to disentangle the moderating effects of the four dimensions of consumer characteristics from each other. This is likely to occur because the four consumer characteristics investigated in the model are correlated to some extent; i.e., the correlation coefficient of 0.695 between Creativity and Local identity indicates that creative consumers are also likely to have strong local identities. Such confounding relationship between the two makes it difficult to disentangle the two effects when they are simultaneously entered as moderators to the impact of another variable (R&D). Therefore, Models 7 – 10 are sufficient for concluding that some of the dimensions in H2 are supported.

[INSERT TABLE 5 ABOUT HERE]

4.3. Effect sizes

Although statistical significance levels are sufficient for supporting the hypothesized relationships, we also looked at the economic significance of the effects, i.e. not only whether the moderation exists, but also the extent of the moderation. This is important, because very often a statistically significant effect may have a small effect size. To extrapolate on the economic significance, we predicted and graphed the expected innovation performance using the coefficient estimates. Figures 1A – 1D present the differential effects of R&D at three different levels of consumer characteristics (sample minimum, mean, and maximum). Figure 1A shows that the

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from the regression are predicted (x_z_residuals). These residuals, by definition, have zero correlation with the variables x and z, but still represent that variation over and above the individual effects of x and z. Finally, the interaction term in the main analysis is replaced by x_z_residuals.

three lines are almost parallel, i.e., there is no significant moderating impact. Nevertheless, there is a clear upward shift of the lines as the level of *buyer sophistication* increases, suggesting that although there is no statistically significant moderating effect, consumer characteristics lead to a vertical shift in the relationship between R&D and innovative performance of the firm. Consistent with predictions, Figures 1B – 1D show that the positive impact of R&D is positively moderated by the level of consumer characteristics (i.e., the lines corresponding to higher levels of consumer characteristics are steeper). The nearly flat lines representing low levels of consumer characteristics indicate that firms' R&D efforts in emerging economies may end up with a small effect, if there are no demand side conditions in the market.

[INSERT FIGURE 1 ABOUT HERE]

The figures also clearly show the moderation effect sizes. Figure 1B shows that, at the minimum level of *creativity* the average predicted innovation performance of a firm that conducts R&D (=1) is 3.82, while that of a firm that does not conduct R&D (=0) is 3.23, representing 1.18 times increase in innovation performance in response to R&D. The same numbers at the mean level of creativity are 11.96 and 5.65 respectively, representing 2.17-fold increase. At the highest level of creativity, the numbers are 24.31 versus 9.32, representing 2.61-fold increase in innovation performance resulting from R&D. Hence, the higher the level of creativity, the stronger is the impact of conducting R&D.

In a similar fashion, at the lowest level of *global identity*, R&D activity results in a move from 4.77 to 6.22, hence 1.3-fold increase; at the mean, from 5.74 to 13.09, hence 2.28-fold increase; and at the maximum, from 6.97 to 21.82, hence 3.13-fold increase. Finally, at the lowest level of *local identity*, R&D leads to improvements in innovation performance from 3.17 to 5.82, hence 1.84-fold increase; at the mean, from 5.82 to 11.71, hence 2.01-fold increase; and finally, at the maximum level of local identity, from 11.20 to 23.70, causing 2.12-fold increase.

5. Discussion

5.1. Theoretical implications

By developing a demand-based perspective that explains how consumer characteristics affect innovation performance, the study makes a number of contributions. First, prior explanations about the determinants of firm innovation performance have focused on either the capabilities and resources of the firm or its environment in terms of institutions, competition, and level of demand. For instance, in resource-based perspectives, the influence of consumers is only assumed by considering firm's own internal resources to seek and gain knowledge about consumers (e.g., market orientation from Acikdilli et al., 2020; Hunt and Morgan, 1995). However, such effort cannot explain how variations in consumer characteristics may serve as a supporting or constraining ground for firm's innovation. Similarly, although the NIS literature has recognized that demand pulls innovation (Di Stefano et al., 2012), only a limited number of prior studies have tried to incorporate the demand-side role (Belitz et al., 2011; Galanakis, 2006), and they looked only at the level of demand, rather than its nature. As a result, despite attempts to examine consumers as lead users and co-producers (Bogers et al., 2010; Füller et al., 2007; Priem et al., 2012; Von Hippel, 1986), the effects of consumer characteristics on firm innovation performance have not adequately been explained.

The current study complements prior perspectives by developing an explanation that hinges on the nature of demand and more specifically on the role of consumer characteristics. It takes into account the role of consumer characteristics across economies by integrating demand-specific and evolutionary considerations in the NIS framework (Aldrich, 2008; Sarta et al., 2020). The four dimensions of consumer characteristics employed in our study reflect the ability to discern the value of innovative products and the attitudes towards innovativeness. We show that

in countries with consumers who appreciate innovative products, firms not only achieve higher innovation performance, but also reap higher returns to their R&D activities. The study therefore explains why firms that possess similar resources may perform differently when they operate in countries that are characterized by consumers with different characteristics.

Second, the study's contribution also encompasses identifying both the direct and moderating effects of four dimensions of consumer characteristics. Although the innovation literature sees R&D as an effective tool to invigorate innovation, we show that in emerging economies variation in consumer characteristics plays a significant role in changing the impact of R&D on firms' innovation performance. A key implication of our analysis is that R&D is not equally effective in driving innovation, but varies depending on the nature of the market demand stemming from consumer characteristics. This brings a new perspective that highlights the critical role of demand-specific factors in determining the market success of R&D efforts, and also resonates with recent calls for understanding the market (Vargo et al., 2017).

Furthermore, the study enhances the understanding of product innovation in emerging economies. Previous research examined the factors that drive innovation differently across markets but demand-specific factors have largely been neglected, except income levels (Crespi, Katz, and Olivari, 2017; Hanson, 2012; Samant, Thakur-Wernz, and Harfield, 2021; Sun, 2017). As consumers in emerging economies are less affluent (McMullen and Bergman, 2018), they might be more selective due to limited disposable income. Controlling for income levels, our analysis demonstrates the effects of consumer characteristics over and above the income-driven effects on innovation performance.

5.2. Managerial and policy implications

While firms in emerging economies tend to suffer from financial constraints (Gorodnichenko and Schnitzer, 2010), our findings suggest that when firms want to enter

emerging economies, they will be better off selecting countries that exhibit the consumer characteristics identified in this study. In markets with consumers who are favorable to innovative products, firms can achieve higher innovation performance. Moreover, differences in the structure of consumer characteristics and demand can also amplify the returns to a firm's R&D. A better understanding of the demand-side of innovation can help firms make more adaptive decisions regarding their resource allocation for product development. This is also important for policy makers who consider R&D to be a solution to support innovation in emerging economies. Despite considerable investments in public R&D and financial incentives for private R&D, the effectiveness of these investments might not reach their full potential in the absence of certain consumer characteristics.

5.3. Limitations and future research

First, we tested our predictions using data for emerging economies. Future research can expand this demand-oriented perspective by identifying the role and the relative importance of consumer characteristics in shaping innovation performance in developed countries. Second, the dataset used in the present study does not allow us to identify multinational firms or their country of origin. However, if multinationals originate from home markets where consumers have high appreciation and liking of innovative products, they might have experience to successfully innovate from the home market and may also perform better in foreign markets that have high demand for innovation. While increasing efforts have been made to overcome the liability of foreignness and other challenges that multinationals from emerging economies face (Marano et al., 2017; Wang et al., 2012; 2020), the impact of the consumer base on multinationals' innovation performance has not been studied beyond the role of cultural influences. The home-country consumer base of multinationals from emerging economies might help firms innovate further in other host countries if the home-country consumers have high demand for innovative

products. Relatedly, while we found that local consumer characteristics influence the effects of firms' R&D, our dataset did not distinguish between local and global R&D. Future research can investigate whether local and global R&D would be influenced by local customer characteristics differently.

Third, our study does not differentiate between incremental and radical innovation (Ritala and Hurmelinna-Laukkanen, 2013), considering that innovation in emerging markets is often incremental and adaptive nature. Moreover, our dataset only provides aggregated measures of innovative product performance (e.g., sales share of innovative products). However, as more disruptive innovations emerge (Lynn et al., 1996), the relationship between consumer characteristics and firm innovation might be different for radical vis-à-vis incremental innovations. Exploring these differences will be a fruitful avenue for future research.

Finally, given that COVID-19 has caused dramatic disruption, it will be worthwhile to examine its impact on firms' responses, innovation activities and performance and the relevance of our findings that were obtained before the pandemic. For instance, Jin et al., (2021) have shown the suppressing effect of the COVID-19 pandemic on firm innovation in China. However, COVID-19 may also spur various initiatives for firm innovation, depending on firms' motivation to innovate and collaboration effort (Wang et al., 2020). As the impact of the pandemic permeates across almost all factors related to firm innovation, various questions remain unanswered, including the influences of working-from-home (George, Lakhani, and Puranam, 2020). Furthermore, under the pandemic, the relationship between consumer characteristics and innovation performance might become dwindled due to disruptions in the selection process, financial constraints among consumers, or change completely not only the level but also the nature of market demand for innovations. Hence, it would be useful to identify how disruptions

and changes in the global context due to the pandemic may change the relationships between consumer characteristics and firms' innovation performance.

6. Conclusion

Drawing on the evolutionary view (Aldrich, 1999, 2008; Campbell, 1960), the current study develops a demand-based perspective that explains the mechanisms through which consumer characteristics influence the innovation performance of firms in emerging economies. Building on the premise that the overall process of creating and commercializing innovative products depends not only on firms but also on consumers and their preferences (Hayek, 1945; Schumpeter, 1942), our perspective identifies four distinct dimensions of consumer characteristics and demonstrates how they influence the nature of demand and in turn the innovation performance of firms in 49 emerging economies. The empirical analysis of the study confirms the key theoretical predictions of the framework. It shows that those four consumer characteristics identified in the study increase firms' innovation performance directly. In addition, however, it shows that these characteristics (except buyer sophistication) strengthen the effectiveness of a firm's R&D on its innovation performance; i.e., they moderate the effects of R&D on innovation performance. Taken together, the framework and empirical analysis of the study complement prior research that seeks to identify the determinants of innovation by introducing a demand-based perspective, identifying which consumer characteristics matter for innovation performance, and shifting the discussion towards demand-specific characteristics that have not attracted sufficient attention in the literature.

REFERENCES

Acikdilli, G., Mintu-Wimsatt, A., Kara, A., Spillan, J.E., 2020. Export market orientation, marketing capabilities and export performance of SMEs in an emerging market: A resource-based approach. Journal of Marketing Theory and Practice, 1-16.

Adams, P., Freitas, I.M.B., Fontana, R., 2019. Strategic orientation, innovation performance and the moderating influence of marketing management. Journal of Business Research 97, 129-140.

Adner, R., Levinthal, D., 2001. Demand Heterogeneity and Technology Evolution: Implications for Product and Process Innovation. Management Science 47, 611-628.

Adomako, S., Amankwah-Amoah, J., Debrah, Y.A., Khan, Z., Chu, I. Robinson, C., 2021. Institutional voids, economic adversity and inter-firm cooperation in an emerging market: the mediating role of government R&D support. British Journal of Management 32, 40-58.

Agarwal, N., Brem, A., 2012. Frugal and reverse innovation-Literature overview and case study insights from a German MNC in India and China, 2012 18th International ICE Conference on Engineering, Technology and Innovation. IEEE, pp. 1-11.

Ahmed, S.A., d'Astous, A., Eljabri, J., 2002. The impact of technological complexity on consumers' perceptions of products made in highly and newly industrialised countries. International Marketing Review 19, 387-407.

Aiken, L.S., West, S.G., Reno, R.R., 1991. Multiple regression: Testing and interpreting interactions. Sage.

Aldrich, H., 1999. Organizations evolving. Sage.

Aldrich, H., 2008. Organizations and environments. Stanford University Press.

Allman, K., Edler, J., Georghiou, L., Jones, B., Miles, I., Omidvar, O., Ramlogan, R., Rigby, J., 2011. Measuring wider framework conditions for successful innovation. A system's review of UK and international innovation data.

Arnett, J.J., 2002. The psychology of globalization. American Psychologist 57, 774.

Ayyagari, M., Demirgüç-Kunt, A., Maksimovic, V., 2011. Firm innovation in emerging markets: The role of finance, governance, and competition. Journal of Financial and Quantitative Analysis 46, 1545-1580.

Barnes, J.G., McTavish, R., 1983. Segmenting industrial markets by buyer sophistication. European Journal of Marketing 17, 16-33.

Bartels, J., Reinders, M.J., 2011. Consumer innovativeness and its correlates: A propositional inventory for future research. Journal of Business Research 64, 601-609.

Becheikh, N., Landry, R., Amara, N., 2006. Lessons from innovation empirical studies in the manufacturing sector: A systematic review of the literature from 1993–2003. Technovation 26, 644-664.

Belitz, H., Clemens, M., von Hirschhausen, C., Schmidt-Ehmcke, J., Werwatz, A., Zloczysti, P., 2011. An indicator for national systems of innovation: Methodology and application to 17 industrialized countries.

Bindroo, V., Mariadoss, B.J., Pillai, R.G., 2012. Customer clusters as sources of innovation-based competitive advantage. Journal of International Marketing 20, 17-33.

Bogers, M., Afuah, A., Bastian, B., 2010. Users as innovators: a review, critique, and future research directions. Journal of Management 36, 857-875.

Boettke, P.J., Candela, R., 2014. Hayek, Leoni, and law as the fifth factor of production. Atlantic Economic Journal, 42, 123-131.

Bonney, L., Davis-Sramek, B., Cadotte, E.R., 2016. “Thinking” about business markets: A cognitive assessment of market awareness. Journal of Business Research 69, 2641-8.

Bounie, D., Dubus, A., Waelbroeck, P., 2021. Selling strategic information in digital competitive markets. The RAND Journal of Economics, 52, 283-313.

Burroughs, J.E., Mick, D.G., 2004. Exploring antecedents and consequences of consumer creativity in a problem-solving context. Journal of Consumer Research 31, 402-411.

Campbell, D., 1960. Blind variation and selective retentions in creative thought as in other knowledge processes. Psychological Review 67, 380-400.

Carlsson, B., Jacobsson, S., Holmén, M., Rickne, A., 2002. Innovation systems: analytical and methodological issues. Research Policy 31, 233-245.

Cassiman, B., Veugelers, R., 2002. R&D cooperation and spillovers: some empirical evidence from Belgium. American Economic Review 92, 1169-1184.

Choung, J.-Y., Hwang, H.-R., Song, W., 2014. Transitions of innovation activities in latecomer countries: an exploratory case study of South Korea. World Development 54, 156-167.

Cleveland, M., Laroche, M., Papadopoulos, N., 2011. Ethnic identity's relationship to materialism and consumer ethnocentrism: Contrasting consumers in developed and emerging economies. Journal of Global Academy of Marketing 21, 55-71.

Cohen, W.M., Levinthal, D.A., 1990. Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly 35, 128-152.

Consoli, D., 2005. The dynamics of technological change in UK retail banking services: An evolutionary perspective. Research Policy 34, 461-480.

Cooper, R.G., 1999. Product leadership: creating and launching superior new products. Basic Books.

Deeds, D.L., 2001. The role of R&D intensity, technical development and absorptive capacity in creating entrepreneurial wealth in high technology start-ups. Journal of Engineering and Technology Management 18, 29-47.

Di Stefano, G., Gambardella, A., Verona, G., 2012. Technology push and demand pull perspectives in innovation studies: Current findings and future research directions. Research Policy 41, 1283-1295.

Edler, J., 2011. Innovation in EU CEE: the role of demand-based policy. Challenges for European Innovation Policy. Cohesion and Excellence from a Schumpeterian Perspective. Edward Elgar: Cheltenham, Northhampton, 177-208.

Edquist, C., Hommen, L., 1999. Systems of innovation: theory and policy for the demand side. Technology in Society 21, 63-79.

Ettlie, J.E., 1998. R&D and global manufacturing performance. Management Science 44, 1-11.

Florida, R., Mellander, C., King, K., 2015. The global creativity index 2015. Martin Prosperity Institute.

Florida, R., Mellander, C., Stolarick, K., 2011. Creativity and prosperity: The global creativity index.

Fosfuri, A., Tribó, J.A., 2008. Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. Omega 36, 173-187.

Füller, J., Jawecki, G., Mühlbacher, H., 2007. Innovation creation by online basketball communities. Journal of Business Research 60, 60-71.

Galanakis, K., 2006. Innovation process. Make sense using systems thinking. Technovation 26, 1222-1232.

Galende, J., de la Fuente, J.M., 2003. Internal factors determining a firm's innovative behaviour. Research Policy 32, 715-736.

George, G., Lakhani, K. R., Puranam, P., 2020. What has changed? The impact of Covid pandemic on the technology and innovation management research agenda. Journal of Management Studies 57, 1754-1758.

Giménez Roche, G.A., Calcei, D., 2021. The role of demand routines in entrepreneurial judgment. Small Business Economics, 56, 209-235.

Gorodnichenko, Y., Svejnar, J., Terrell, K., 2010. Globalization and Innovation in Emerging Markets. American Economic Journal. Macroeconomics 2, 194.

Greenaway, K.H., Haslam, S.A., Cruwys, T., Branscombe, N.R., Ysseldyk, R., Heldreth, C., 2015. From" we" to" me": Group identification enhances perceived personal control with consequences for health and well-being. Journal of Personality and Social Psychology 109, 53-74.

Guan, J., Chen, K., 2012. Modeling the relative efficiency of national innovation systems. Research Policy 41, 102-115.

Gui-long, Z., Yi, Z., Kai-hua, C. and Jiang, Y., 2017. The impact of R&D intensity on firm performance in an emerging market: Evidence from China's electronics manufacturing firms. Asian Journal of Technology Innovation 25, 41-60.

Guo, X., 2013. Living in a global world: Influence of consumer global orientation on attitudes toward global brands from developed versus emerging countries. Journal of International Marketing 21, 1-22.

Hall, B.H., Jaffe, A.B., 2012. Measuring Science, Technology, and Innovation: A Review.

Hanson, G.H., 2012. The rise of middle kingdoms: Emerging economies in global trade. Journal of Economic Perspectives, 26, 41-64.

Hauser, J., Tellis, G.J., Griffin, A., 2006. Research on innovation: A review and agenda for marketing science. Marketing Science 25, 687-717.

Hauser, J.R., 1984. Consumer research to focus R&D projects. Journal of Product Innovation Management 1, 70-84.

Hayek, F.A., 1945. The use of knowledge in society. The American Economic Review 35, 519-530.

He, J., Wang, C.L., 2017. How global brands incorporating local cultural elements increase consumer purchase likelihood: an empirical study in China. International Marketing Review 34, 463-479.

He, Z.-L., Wong, P.-K., 2004. Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. Organization Science 15, 481-494.

Heinberg, M., Ozkaya, H.E., Taube, M., 2016. A brand built on sand: Is acquiring a local brand in an emerging market an ill-advised strategy for foreign companies? Journal of the Academy of Marketing Science 44, 586-607.

Herbig, P. A. 1998. Handbook for Cross Cultural Marketing, The International Business Press, Binghamton, NY

Herbig, P.A. and Day, R.L., 1992. Customer acceptance: the key to successful introductions of innovations. Marketing Intelligence & Planning 10, 4-15.

Hill, J.D., 1998. Creating the self: Toward a cosmopolitan identity.

Hirschman, E.C., 1980. Innovativeness, novelty seeking, and consumer creativity. Journal of Consumer Research 7, 283-295.

Hirschman, E.C., 1983. Consumer intelligence, creativity, and consciousness: Implications for consumer protection and education. Journal of Public Policy & Marketing 2, 153-170.

Hoelscher, M., Schubert, J., 2015. Potential and problems of existing creativity and innovation indices. Creativity Research Journal 27, 1-15.

Hollanders, H., Arundel, A., 2007. Differences in socio-economic conditions and regulatory environment: explaining variations in national innovation performance and policy implications. Inno Metrics.

Hunt, S.D., Morgan, R.M., 1995. The comparative advantage theory of competition. Journal of Marketing 59, 1-15.

Im, S., Bayus, B.L., Mason, C.H., 2003. An empirical study of innate consumer innovativeness, personal characteristics, and new-product adoption behavior. Journal of the Academy of Marketing Science 31, 61-73.

Jin, X., Zhang, M., Sun, G., Cui, L., 2021. The impact of COVID-19 on firm innovation: Evidence from Chinese listed companies. Finance Research Letters, 102133.

Kafouros, M.I., Buckley, P.J., 2008. Under what conditions do firms benefit from the research efforts of other organizations?. Research Policy 37, 225-239.

Kafouros, M., Wang, C., Mavroudi, E., Hong, J., Katsikeas, C.S., 2018. Geographic dispersion and co-location in global R&D portfolios: Consequences for firm performance. Research Policy 47,1243-1255.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2014. The Worldwide Governance Indicators. The World Bank Group, http://info.worldbank.org/governance/wgi/.

Khan, Z., Lew, Y.K. and Marinova, S., 2019. Exploitative and exploratory innovations in emerging economies: The role of realized absorptive capacity and learning intent. International Business Review 28, 499-512.

Kirzner, I.M., 1997. Entrepreneurial discovery and the competitive market process: An Austrian approach. Journal of Economic Literature 35, 60-85.

Kostopoulos, K., Papalexandris, A., Papachroni, M., Ioannou, G., 2011. Absorptive capacity, innovation, and financial performance. Journal of Business Research 64, 1335-1343.

Lee, R., Lee, J.-H., Garrett, T.C., 2019. Synergy effects of innovation on firm performance. Journal of Business Research 99, 507-515.

Lewin, A.Y., Long, C.P., Carroll, T.N., 1999. The coevolution of new organizational forms. Organization Science 10, 535-550.

Liu, Z., Guo, Q., Sun, P., Wu, R., 2018. Does religion hinder creativity? A national level study on the roles of different denominations. Frontiers in Psychology 9, 1912.

Lynn, G.S., Morone, J.G., Paulson, A.S., 1996. Marketing and discontinuous innovation: the probe and learn process. California Management Review 38, 8-37.

Mahroum, S., Al-Saleh, Y., 2013. Towards a functional framework for measuring national innovation efficacy. Technovation 33, 320-332.

Mansori, S., Sambasivan, M., and Md-Sidin, S. 2015. Acceptance of novel products: the role of religiosity, ethnicity and values. Marketing Intelligence & Planning 33, 39-66.

Marano, V., Tashman, P., Kostova, T., 2017. Escaping the iron cage: Liabilities of origin and CSR reporting of emerging market multinational enterprises. Journal of International Business Studies 48, 386-408.

Marxt, C., Brunner, C., 2013. Analyzing and improving the national innovation system of highly developed countries—The case of Switzerland. Technological Forecasting and Social Change 80, 1035-1049.

Mavroudi, E., Kesidou, E., Pandza, K., 2020. Shifting back and forth: How does the temporal cycling between exploratory and exploitative R&D influence firm performance?. Journal of Business Research 110, 386-396.

Mawdsley, J.K., Somaya, D., 2018. Demand-side strategy, relational advantage, and partner-driven corporate scope: The case for client-led diversification. Strategic Management Journal 39, 1834-59.

Maynard, M.T., Falcone, E.C., Petersen, K.J., Fugate, B.S., Bonney, L., 2020. Conflicting paradigms in manufacturing and marketing decisions: The effects of situational awareness on team performance. International Journal of Production Economics, 230, 107801.

McMullen, J.S., Bergman Jr, B.J. 2018. The promise and problems of price subsidization in social entrepreneurship. Business Horizons 61, 609-21.

Meyer, K.E., Peng, M.W., 2016. Theoretical foundations of emerging economy business research. Journal of International Business Studies 47, 3-22.

Midgley, D.F., Dowling, G.R., 1978. Innovativeness: The concept and its measurement. Journal of Consumer Research 4, 229-242.

Morris, M.H., Avila, R.A., Alien, J., 1993. Individualism and the modern corporation: Implications for innovation and entrepreneurship. Journal of Management 19, 595-612.

Morrison, P.D., Roberts, J.H., von Hippel, E., 2000. Determinants of User Innovation and the Sharing of Product Modifications. Management Science 46, 1513-1527.

Mowery, D., Rosenberg, N., 1979. The influence of market demand upon innovation: a critical review of some recent empirical studies. Research Policy 8, 102-153.

Myers, R.H., 1990. Classical and modern regression with applications. Duxbury press Belmont, CA.

Nambisan, S., 2002. Designing virtual customer environments for new product development: Toward a theory. Academy of Management Review 27, 392-413.

Nambisan, S., Zahra, S.A., 2016. The role of demand-side narratives in opportunity formation and enactment. Journal of Business Venturing Insights 5, 70-5.

Nelson, R.R., 1993. National innovation systems: a comparative analysis. Oxford University Press on Demand.

Nelson, R.R., Nelson, K., 2002. Technology, institutions, and innovation systems. Research Policy 31, 265-272.

Nelson, R.R., Winter, S.G. 1982. An Evolutionary Theory of Economic Change. Belknap Press of Harvard University Press, Cambridge, Massachusetts and London, England.

Nemet, G.F., 2009. Demand-pull, technology-push, and government-led incentives for non-incremental technical change. Research Policy 38, 700-709.

Nie, X., Yang, Z., Zhang, Y., Janakiraman, N., 2021. How Does Global–Local Identity Affect Consumer Preference for Access-Based Consumption? Investigating the Mediating Role of Consumption Openness. Journal of Marketing Research, ahead-of-print. https://doi.org/10.1177/00222437211055130.

Nunes, P., Johnson, B., 2004. Mass Affluence: Seven New Rules of Marketing to Today's Consumer. Harvard Business Press.

Pichler, F., 2012. Cosmopolitanism in a global perspective: An international comparison of open-minded orientations and identity in relation to globalization. International Sociology 27, 21-50.

Porter, M., 1990. The competitive advantage of nations. Harvard Business Review 68, 73-93.

Priem, R.L., Li, S., Carr, J.C., 2012. Insights and new directions from demand-side approaches to technology innovation, entrepreneurship, and strategic management research. Journal of Management 38, 346-374.

Rammer, C. and Schubert, T., 2018. Concentration on the few: mechanisms behind a falling share of innovative firms in Germany. Research Policy 47, 379-389.

Raymond, L., St-Pierre, J., 2010. R&D as a determinant of innovation in manufacturing SMEs: An attempt at empirical clarification. Technovation 30, 48-56.

Reed, A., 2002. Social identity as a useful perspective for self-concept–based consumer research. Psychology & Marketing 19, 235-266.

Ren, S., Eisingerich, A.B., Tsai, H.-T., 2015. How do marketing, research and development capabilities, and degree of internationalization synergistically affect the innovation performance of small and medium-sized enterprises (SMEs)? A panel data study of Chinese SMEs. International Business Review 24, 642-651.

Reynoso, J., Kandampully, J., Fan, X., Paulose, H., 2015. Learning from socially driven service innovation in emerging economies. *Journal of Service Management* 26, 156-176.

Rhyne, L.C., Teagarden, M.B., Van den Panhuyzen, W., 2002. Technology-based competitive strategies: The relationship of cultural dimensions to new product innovation. The Journal of High Technology Management Research 13, 249-277.

Riefler, P., Diamantopoulos, A., Siguaw, J.A., 2012. Cosmopolitan consumers as a target group for segmentation. Journal of International Business Studies 43, 285-305.

Rinne, T., Steel, G.D., Fairweather, J., 2013. The role of Hofstede's individualism in national-level creativity. Creativity Research Journal 25, 129-136.

Ritala, P., Hurmelinna-Laukkanen, P., 2013. Incremental and radical innovation in coopetition—The role of absorptive capacity and appropriability. Journal of Product Innovation Management 30, 154-169.

Rodríguez-Gulías, M.J., Rodeiro-Pazos, D., Fernández-López, S. and Nogueira-Moreiras, M.Á., 2021. The effect of regional resources on innovation: a firm-centered approach. The Journal of Technology Transfer 46, 760-791.

Rojenko, V., Dahs, A., 2017. Demographic Determinants of Creativity: The Analysis of the Development of Creative Potential and Forecast for the Baltic States. Economics and Business 30, 79-90.

Rubera, G., Ordanini, A., Griffith, D.A., 2011. Incorporating cultural values for understanding the influence of perceived product creativity on intention to buy: An examination in Italy and the US. Journal of International Business Studies 42, 459-476.

Ruttan, V.W., 1997. Induced Innovation, Evolutionary Theory and Path Dependence: Sources of Technical Change, The Economic Journal 107, 1520–1529.

Samant, S., Thakur-Wernz, P., Hatfield, D.E., 2021. The impact of differences in internationalization processes on innovation by emerging economy firms. International Journal of Emerging Markets, ahead-of-print. https://doi.org/10.1108/IJOEM-11-2020-1331.

Sarta, A., Durand, R., Vergne, J.-P., 2020. Organizational Adaptation. Journal of Management, 1-33.

Schnell, S.M., Reese, J.F., 2003. Microbreweries as tools of local identity. Journal of Cultural Geography 21, 45-69.

Schumpeter, J., 1942. Creative destruction. Capitalism, socialism and democracy 825, 82-85.

Schwab, K., 2017. The Global Competitiveness Report 2017-2018. World Economic Forum.

Shane, S., 1993. Cultural influences on national rates of innovation. Journal of Business Venturing 8, 59-73.

Simonton, D.K., 1999. The continued evolution of creative Darwinism. Psychological Inquiry 10, 362-367.

Singh, S., 2006. Cultural differences in, and influences on, consumers' propensity to adopt innovations. International Marketing Review 23, 173-191.

Singh, J., Fleming, L. 2010. Lone Inventors as Sources of Breakthroughs: Myth or Reality? Management Science 56, 41-56.

Sohl, T., Vroom, G., McCann, B.T., 2020. Business model diversification and firm performance: A demand-side perspective. Strategic Entrepreneurship Journal 14, 198-223.

Steenkamp, J.-B.E., Baumgartner, H., 1992. The role of optimum stimulation level in exploratory consumer behavior. Journal of Consumer Research 19, 434-448.

Steenkamp, J.-B.E., Ter Hofstede, F., Wedel, M., 1999. A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness. Journal of Marketing 63, 55-69.

Stokey, N.L., 1995. R&D and economic growth. The Review of Economic Studies, 62, 469-489.

Sun, S.L., 2009. Internationalization strategy of MNEs from emerging economies: The case of Huawei. Multinational Business Review, 129-155.

Tajfel, H., Turner, J.C., 1992. The social identity theory of intergroup behavior. Readings on communicating with strangers, 112-118.

Tellis, G.J., Yin, E., Bell, S., 2009. Global consumer innovativeness: Cross-country differences and demographic commonalities. Journal of International Marketing 17, 1-22.

Vargo, S. L., Koskela-Huotari, K., Baron, S., Edvardsson, B., Reynoso, J., Colurcio, M., 2017. A systems perspective on markets–Toward a research agenda. Journal of Business Research 79, 260-268.

Vega-Jurado, J., Gutiérrez-Gracia, A., Fernández-de-Lucio, I., Manjarrés-Henríquez, L., 2008. The effect of external and internal factors on firms' product innovation. Research Policy 37, 616-632.

Venaik, S., Midgley, D.F., 2015. Mindscapes across landscapes: Archetypes of transnational and subnational culture. Journal of International Business Studies 46, 1051-1079.

Von Hippel, E., 1986. Lead users: a source of novel product concepts. Management science 32, 791-805.

Wang, C., Kafouros, M.I., 2009. What factors determine innovation performance in emerging economies? Evidence from China. International Business Review 18, 606-616.

Wang, C., Hong, J., Kafouros, M., Wright, M., 2012. Exploring the role of government involvement in outward FDI from emerging economies. Journal of International Business Studies 43, 655-676.

Wang, C., Kafouros, M., Yi, J., Hong, J., Ganotakis, P., 2020. The role of government affiliation in explaining firm innovativeness and profitability in emerging countries: Evidence from China. Journal of World Business *55*, 101047.

Wang, Y., Hong, A., Li, X., Gao, J., 2020. Marketing innovations during a global crisis: A study of China firms' response to COVID-19. Journal of Business Research 116, 214-220.

Xie, Z., Li, J., 2018. Exporting and innovating among emerging market firms: The moderating role of institutional development. Journal of International Business Studies 49, 222-245.

Yam, R.C., Guan, J.C., Pun, K.F., Tang, E.P., 2004. An audit of technological innovation capabilities in Chinese firms: some empirical findings in Beijing, China. Research Policy 33, 1123-1140.

Ye, G., Mukhopadhyay, S. K., 2010. Role of demand-side strategy in quality competition. International Journal of Production Economics 145, 696-701.

Zhang, Y., Antonio, S., 2005. Will consumers prefer global or local brands? The role of identity accessibility in consumer preference for global versus local brands. Marketing Theory and Applications, 125.

Zhang, Y., Khare, A., 2009. The impact of accessible identities on the evaluation of global versus local products. Journal of Consumer Research 36, 524-537.

Zhou, K.Z., Li, C.B., 2010. How strategic orientations influence the building of dynamic capability in emerging economies. Journal of Business Research 63, 224-231.

Zhou, K.Z., Yim, C.K., Tse, D.K., 2005. The effects of strategic orientations on technology-and market-based breakthrough innovations. Journal of Marketing 69, 42-60.

Table 1 Distribution of observations in the sample by countries, and sub-populations

Country	*Full Sample*	*Sub-sample 1*	*Sub-sample 2*	*Sub-sample 3*	*Sub-sample 4*
Albania	456	456	456		
Armenia	697	697	697	697	697
Azerbaijan	674	674	674	674	674
Bangladesh	1,415	1,415	1,415		
Belarus	559		559	559	
Bosnia-Herzegovina	654	654	654		
Bulgaria	528	528	528		
Croatia	494	494	494		
Cyprus	350	350	350	350	350
Czech Republic	438	438	438		
Egypt	2,744	2,744	2,744	2,744	2,744
Estonia	484	484	484	484	484
FYR Macedonia	681	681	681		
Georgia	656	656	656	655	655
Ghana	692	692	692	692	692
Greece	297	297	297		
Hungary	520	520	520		
India	9,158	9,158	9,158	9,158	9,158
Israel	477	477	477		
Jordan	510	510	510	510	510
Kazakhstan	1,017	1,017	1,017	1,017	1,017
Kenya	717	717	717		
Kyrgyzstan	480	480	480	480	480
Latvia	531	531	531		
Lebanon	499	499	499	499	499
Lithuania	470	470	470		
Malawi	434	434	434		
Moldova	680	680	680		
Mongolia	686	686	686		
Montenegro	233	233	233		
Morocco	378	378	378	378	378
Nepal	480	480	480		
Nigeria	1,763	1,763		1,763	
Pakistan	690	690	690	690	690
Poland	807	807	807	807	807
Romania	955	955	955	955	955
Russia	5,049	5,049	5,049	5,046	5,046
Serbia	698	698	698		
Slovak Republic	475	475	475		
Slovenia	497	497	497	497	497
Tajikistan	663	663	663		
Tanzania	636	636	636		
Tunisia	582	582	582	582	582
Turkey	2,247	2,247	2,247	2,247	2,247
Uganda	657	657	657		
Ukraine	1,623	1,623	1,623	1,621	1,621
Uzbekistan	728		728	728	
Yemen	339	339	339	339	339
Zambia	678	678	678		
Total	**48,176**	**46,889**	**46,413**	**34,172**	**31,122**
Sub-population size		1,698,830	1,758,039	1,360,265	1,274,081
Population size	1,771,526	1,873,000	1,873,000	1,872,981	1,872,981

Table 2 Definitions of Variables and Data Sources

Variable	Description	Source
Dependent variable		
Proportion of new product sales in total sales	"In fiscal year [insert last complete fiscal year], what percentage of this establishment's total annual sales was accounted for by products that were introduced or significantly improved over the last three years? [BEEPS variable code: ECAo4]".	Source: BEEPS and Enterprise Surveys Innovation Module (ESIM)
Consumer characteristics variables		
Buyer sophistication	The degree to which buyers understand innovation and utilize it.	Executive Opinion Survey for Global Competitive Index, WEF
Creativity	The capability of individuals in solving consumption-related problems.	Global Creativity Index (Florida et al., 2015)
Global identity	The degree to which individuals identify themselves as a world citizen.	World Values Survey
Local identity	The degree to which individuals identify themselves as part of their local community.	World Values Survey
Firm's R&D activity variable		
Firm R&D	"During the last three years, did this establishment spend on research and development activities, either in-house or contracted with other companies (outsourced)? [BEEPS variable code h6]".	BEEPS and ESIM
Control variables		
Size	Number of employees [L.1] (in natural logarithm).	BEEPS and ESIM
Age	Number of years since the establishment of the firm.	BEEPS and ESIM
Foreign ownership share	% owned by private foreign individuals" (individuals refer to private persons and organizations) [b2b].	BEEPS and ESIM
Manager experience	"Top Manager's number of yrs of experience working in this sector" [b7] (in natural logarithm)	BEEPS and ESIM
Credit line availability	"Have a line of credit or a loan from a financial institution at time of the" [k8].	BEEPS and ESIM
Foreign technology license	"Technology licensed from a foreign-owned company (Yes/No)".	BEEPS and ESIM
GDP per capita	GDP per capita, PPP (constant 2011 international $) (in natural logarithm).	World Development Indicators database
Rule of law	Definition: Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Bank, World Governance Indicators database
Country import intensity	The ratio of imports over GDP	World Development Indicators database
Country export intensity	The ratio of exports over GDP	World Development Indicators database

Table 3 Descriptive statistics and correlations*

	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Proportion of new product sales in total sales	6.94	18.05															
2	R&D	0.20	0.40	0.144														
				0.000														
3	Buyer sophistication	3.36	0.45	0.013	0.085													
				0.005	*0.000*													
4	Creativity	0.37	0.15	0.061	-0.024	0.394												
				0.000	*0.000*	*0.000*												
5	Global identity	2.05	0.43	0.075	-0.178	-0.196	0.343											
				0.000	*0.000*	*0.000*	*0.000*											
6	Local identity	1.93	0.62	0.077	-0.086	0.386	0.695	0.583										
				0.000	*0.000*	*0.000*	*0.000*	*0.000*										
7	Size (employees)	93.61	404.15	0.061	0.224	0.110	0.002	-0.030	-0.021									
				0.000	*0.000*	*0.000*	*0.618*	*0.000*	*0.000*									
8	Age (years)	15.58	16.59	-0.015	0.069	-0.017	-0.057	-0.126	-0.186	0.229								
				0.001	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*								
9	Foreign ownership share	5.20	20.42	0.039	0.048	-0.070	-0.009	0.053	-0.021	0.138	-0.024							
				0.000	*0.000*	*0.000*	*0.054*	*0.000*	*0.000*	*0.000*	*0.000*							
10	Manager experience	16.53	10.53	0.025	-0.006	-0.050	0.045	0.102	-0.048	0.078	0.379	-0.016						
				0.000	*0.213*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*						
11	Credit line availability	0.33	0.47	0.083	0.109	0.086	0.139	-0.012	0.015	0.186	0.080	-0.003	0.100					
				0.000	*0.000*	*0.000*	*0.000*	*0.028*	*0.005*	*0.000*	*0.000*	*0.460*	*0.000*					
12	Foreign technology license	0.11	0.31	0.059	0.100	-0.015	-0.003	-0.005	-0.004	0.178	0.034	0.114	0.028	0.058				
				0.000	*0.000*	*0.001*	*0.474*	*0.303*	*0.404*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*				
13	GDP per capita	11,536	8,298	0.044	-0.070	0.372	0.724	0.586	0.667	0.005	-0.060	0.004	0.125	0.137	0.042			
				0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.295*	*0.000*	*0.434*	*0.000*	*0.000*	*0.000*			
14	Rule of Law	-0.34	0.56	-0.025	0.068	0.179	0.259	-0.237	-0.400	0.031	0.099	0.053	0.133	0.155	0.036	0.360		
				0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*		
15	Country import intensity	39.88	19.31	0.055	-0.023	-0.116	0.183	0.081	-0.079	-0.034	-0.006	0.103	0.075	0.162	0.020	0.115	0.372	
				0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.180*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	
16	Country export intensity	34.10	16.26	0.037	-0.058	0.116	0.476	0.191	0.314	-0.054	-0.025	0.098	0.045	0.105	0.019	0.449	0.360	0.712
				0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*

**P-values* in italics

Table 4 Regression results: effects of consumer characteristics on product innovation performance (proportion of new product sales in total sales)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-12.315*	-17.438*	-10.879*	-17.351*	-9.061+	-17.372+
	(5.441)	(8.152)	(4.648)	(7.173)	(5.149)	(8.889)
Control variables						
Size	0.115	0.041	0.101	0.093	-0.069	-0.053
	(0.163)	(0.167)	(0.164)	(0.191)	(0.195)	(0.201)
Age	-0.718*	-0.767*	-0.753*	-0.836*	-0.940**	-0.930*
	(0.303)	(0.314)	(0.309)	(0.350)	(0.356)	(0.377)
Foreign ownership share	0.028*	0.032**	0.029*	0.021	0.028+	0.026
	(0.012)	(0.012)	(0.012)	(0.016)	(0.016)	(0.016)
Manager experience	0.233	0.388	0.282	0.277	0.559	0.673
	(0.347)	(0.361)	(0.344)	(0.406)	(0.389)	(0.422)
Credit line availability	1.478**	1.491**	1.415**	1.906**	1.843**	1.993***
	(0.465)	(0.476)	(0.466)	(0.581)	(0.575)	(0.598)
Foreign technology license	3.846***	3.951***	4.038***	4.181***	4.170***	4.405***
	(0.825)	(0.842)	(0.826)	(0.994)	(0.995)	(1.021)
GDP per capita	2.277***	1.940**	1.636**	2.425**	1.431*	-1.270
	(0.613)	(0.712)	(0.526)	(0.853)	(0.588)	(0.916)
Rule of law	-2.539***	-3.615***	-2.740***	-0.707	1.209+	2.325
	(0.654)	(0.975)	(0.700)	(0.747)	(0.703)	(1.488)
Country import intensity	-0.034	-0.028	-0.008	-0.150**	-0.081*	-0.100*
	(0.029)	(0.026)	(0.026)	(0.048)	(0.040)	(0.045)
Country export intensity	0.031	0.046+	-0.025	0.166***	0.044	-0.058
	(0.023)	(0.025)	(0.022)	(0.036)	(0.030)	(0.063)
Firm R&D activity variable						
R&D	7.170***	7.065***	7.114***	6.184***	5.760***	5.925***
	(0.644)	(0.653)	(0.650)	(0.722)	(0.724)	(0.739)
Consumer characteristics variables						
H1a: Buyer sophistication		1.737**				5.294***
		(0.561)				(0.959)
H1b: Creativity			10.483***			9.482*
			(2.836)			(4.446)
H1c: Global identity				2.519***		7.668***
				(0.699)		(1.038)
H1d: Local identity					5.136***	2.158
					(1.488)	(2.279)
R^2	0.101	0.104	0.104	0.106	0.109	0.116
F-statistic	15.36***	14.84***	18.72***	12.90***	13.17***	16.14***
Sub-population	Full sample	SP1	SP2	SP3	SP3	SP4
N	48,176	46,889	46,413	34,172	34,172	31,122

Note. Industry and time fixed effect are included. Standard errors in parentheses. Statistical significance at the +10%, *.5%, **.1%, and ***0.1% levels, respectively.

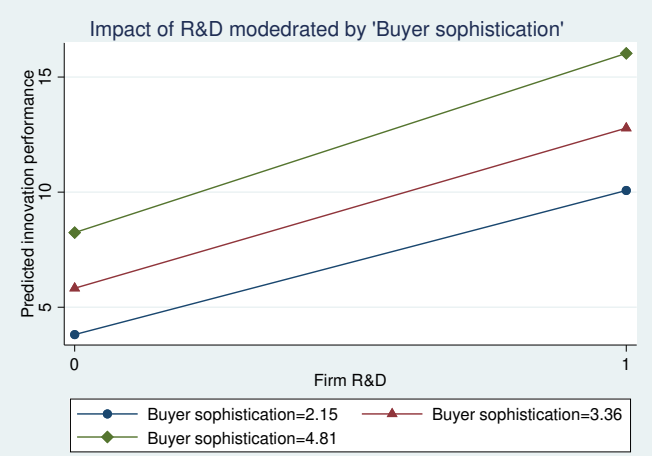
Table 5 Regression results: interaction effects between consumer characteristics and firm R&D on product innovation performance (proportion of new product sales in total sales)

Variable	Model 7	Model 8	Model 9	Model 10	Model 11
Constant	-17.035*	-6.634	-11.920+	-3.935	-10.918
	(8.361)	(4.721)	(7.235)	(5.158)	(9.427)
Control variables					
Size	0.039	0.088	0.058	-0.094	-0.093
	(0.168)	(0.162)	(0.187)	(0.192)	(0.197)
Age	-0.763*	-0.783*	-0.936**	-1.006**	-1.026**
	(0.316)	(0.308)	(0.348)	(0.355)	(0.377)
Foreign ownership share	0.032**	0.028*	0.021	0.028+	0.027
	(0.012)	(0.012)	(0.016)	(0.015)	(0.016)
Manager experience	0.385	0.286	0.348	0.599	0.742+
	(0.360)	(0.347)	(0.416)	(0.400)	(0.434)
Credit line availability	1.492**	1.427**	1.917***	1.865**	1.983***
	(0.476)	(0.465)	(0.583)	(0.576)	(0.600)
GDP per capita	3.972***	4.108***	4.119***	4.258***	4.398***
	(0.839)	(0.824)	(0.994)	(0.989)	(1.021)
Rule of law	1.925**	1.309*	2.052*	1.027+	-1.668+
	(0.718)	(0.539)	(0.862)	(0.592)	(0.940)
Country import intensity	-3.610***	-2.521***	-0.425	1.626*	2.176
	(0.978)	(0.709)	(0.746)	(0.688)	(1.490)
Country export intensity	-0.028	-0.012	-0.156**	-0.086*	-0.122**
	(0.026)	(0.026)	(0.048)	(0.040)	(0.045)
Firm R&D activity variable					
R&D	5.027	-0.817	-13.147**	-4.894	-11.417
	(6.494)	(1.775)	(4.355)	(3.207)	(10.084)
Consumer characteristics variables					
Buyer sophistication	1.666**				5.442***
	(0.619)				(0.990)
Creativity		8.160**			8.487+
		(2.928)			(4.528)
Global identity			1.642*		7.032***
			(0.711)		(1.051)
Local identity				4.570**	1.135
				(1.518)	(2.338)
Interactions					
H2a: R&D x Buyer sophistication	0.574				-0.255
	(1.917)				(2.238)
H2b: R&D x Creativity		19.275***			3.447
		(5.079)			(6.557)
H2c: R&D x Global identity			10.000***		6.135*
			(2.470)		(2.443)
H2d: R&D x Local identity				5.591**	2.776
				(1.895)	(2.810)
R^2	0.104	0.107	0.112	0.113	0.123
F-statistic	15.60***	22.02***	14.34***	14.42***	17.63***
Sub-population	SP1	SP2	SP3	SP3	SP4
N	46,889	46,413	34,172	34,172	31,122

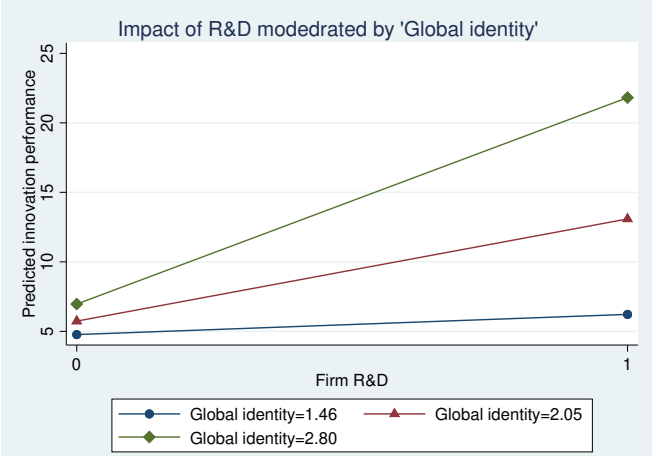
Note. Industry and time fixed effect are included. Standard errors in parentheses. Statistical significance at the +10%, *.5%, **.1%, and ***0.1% levels, respectively.

Figure 1 Interaction effects of R&D and consumer characteristics on innovation performance.

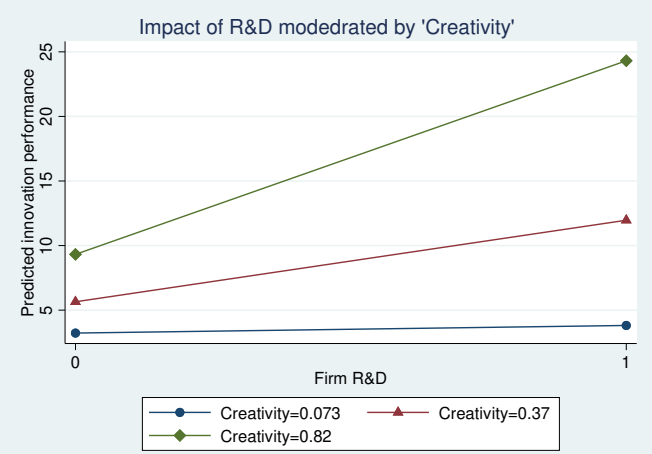
A Moderation by buyer sophistication



C Moderation by global identity



B Moderation by creativity



D Moderation by local identity