We are in it together: Communitarianism and the performance-innovation relationship

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1. Introduction

The relationship between firm performance and innovation behavior has been widely studied, yet theoretical and empirical findings are still widely diverge. We investigate this inconsistency through the lens of informal institutions, specifically communitarianism, the degree to which group goals are considered more important than individual goals. We do this through an analysis of a firm-level dataset covering 31,860 firms across 56 countries. We find evidence for a 'cushion effect', where firms in highly communitarian settings benefit from informal insurance in order to engage in innovation activity when their performance is below their aspirational value. Firms experiencing performance above aspirational value are also more likely to engage in innovation activity in highly communitarian settings due to a 'pay-it-forward' mechanism, using innovation activities to contribute to community challenges. Both effects are conditional on firms being sufficiently embedded in their direct business environment. We discuss the direct and wider implications for the literature on performance-innovation behavior and provide guidance for policymakers and practitioners.

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ABSTRACT

The relationship between firm performance and innovation behavior has been widely studied, yet theoretical and empirical findings are still widely diverge. We investigate this inconsistency through the lens of informal institutions, specifically communitarianism, the degree to which group goals are considered more important than individual goals. We do this through an analysis of a firm-level dataset covering 31,860 firms across 56 countries. We find evidence for a 'cushion effect', where firms in highly communitarian settings benefit from informal insurance in order to engage in innovation activity when their performance is below their aspirational value. Firms experiencing performance above aspirational value are also more likely to engage in innovation activity in highly communitarian settings due to a 'pay-it-forward' mechanism, using innovation activities to contribute to community challenges. Both effects are conditional on firms being sufficiently embedded in their direct business environment. We discuss the direct and wider implications for the literature on performance-innovation behavior and provide guidance for policymakers and practitioners.
in the relative dearth of attention for the role of the firm environment. Although early works exploring potential moderating factors discussed both internal and external factors (Mone et al., 1998), there has been hardly any empirical work investigating external factors. This is a missed opportunity for two main reasons. First, increased scholarly attention to institutional linkages of firms with their environments (Baum and Ingram, 2002; Baum et al., 2005; Greve and Teh, 2018), as well as an intense diversification of environmental contexts in management literature, have shown not just the relevance but also salience of the role of environmental factors on firm behavior in the performance-innovation nexus (Gavetti et al., 2012; Posen et al., 2018; Schneider and Meyer, 2016). Firm-environment characteristics such as market structure and institutional make-up are known to strongly affect both behavior between firms and other actors in their environment, as well as interactions within firms (Wright et al., 2005). Secondly, empirical discrepancies found in the performance-innovation relationship literature, for instance opposite findings for firms in Japan (O’Brien and David, 2013) and the US (Zathath and Braun, 2009), also practically highlight the apparent importance of contextual differences.

In this study, we will assess the effect of a firm’s context on the performance-innovation relationship by focusing on communitarianism, an informal institution that has a strong effect on a firm’s external relationships. Informal institutions are “socially shared rules, usually unwritten, that are created, communicated and enforced outside of official channels. By contrast, formal institutions are rules and procedures that are created, communicated, and enforced through channels widely accepted as official.” (Helmkne and Levitsky, 2003, p. 727). Informal institutions are known for having strong effects on firm behavior related to innovation (Gelfand et al., 2017; Laursen et al., 2020; Tabellini, 2010; Urbano et al., 2019; Weng et al., 2021). While under-investigated, they are a highly promising factor in explaining heterogeneity in innovation decision making. For example, Marshall and Dolley (2019) explore how rapid development of peri-urban areas in India and China affect the local informal institutional balance, causing local farmers to increasingly collaborate in experimentation and local innovation to address new challenges. Autoio et al. (2014) describe more broadly how changing social norms with respect to entrepreneurship affected entrepreneurial attitudes and behavior, and arguably by extension also other risky activities such as innovation. Finally, a recent study on commercial bribery in China showed how this practice, being part of guanxi or networking, results in stronger firm ties and higher quality R&D and higher propensity of innovation (Weng et al., 2021).

Communitarianism, an important informal institution, centers around the relative dominance of group goals vis-à-vis the individual and is known to critically impact risk preferences under various performance conditions (Yang et al., 2014). It is thereby directly associated with the primary underlying mechanisms of the performance feedback theories, and thus highly promising to investigate the moderating effects of informal institutions. We do so by using a uniquely constructed dataset of 31,860 private firms across 56 countries. By going beyond the typical focus of large publicly-listed companies in a select group of Western economies, we can reliably investigate the moderating effect of communitarianism.

We aim to contribute to the performance-innovation debate in three main ways. First, we aim to contribute to the resolution of the current theoretical and empirical heterogeneity by introducing the firm-environment dimension, often suggested as highly relevant (Gavetti et al., 2012; Greve and Teh, 2018) but to our knowledge not yet done in practice. We do this in our case through the informal institution of communitarianism, as a moderating factor for the performance-innovation relationship. Second, we contribute to the literature on performance feedback, problematic search and slack search, by investigating how these mechanisms operate in a wide array of contexts with different levels of communitarianism. This is not just relevant because attention to different contexts is a current research priority (Allard and Williams, 2020; George et al., 2016), but also because different mechanisms of innovation decision making also affect firm-level as well as community outcomes, and hence also policy recommendations. Finally, flowing from the two previous contributions, we add to a wider reorientation in the innovation decision literature towards a greater focus on studying the underlying behavioral mechanisms of key decision makers within firms and between firms and their environment (Posen et al., 2018).

2. Theory and hypotheses

2.1 Communitarianism

The idea that societal customs and traditions play a strong role in determining economic behavior goes back as far as the nineteenth century (Veblen, 1898), and gained renewed attention under the wave of new institutional economics (North, 1991: 97). Informal institutions have a strong role in governing the behavior of individuals in societies (OECD, 2007), but also firms, shaping goal formation, decision processes and typical outcomes (Dolfsma and Verburg, 2008; Ostapenko, 2017). As such, they affect relationships within and between firms. Well known examples of informal institutions include meritocracy, the Dutch polder model, clientelism, corruption, informal forms of conflict resolution, which can either exist complementary to formal institutions or fill institutional voids (Helmke and Levitsky, 2003). Communitarianism and associated principles of social insurance are arguably one of the most important informal institutions (Rodrik, 2000), and is directly linked to the major cultural dimension of individualism vs. collectivism (Hofstede, 1984; Schwartz, 2006).

Communitarianism refers to a societal structure in which people derive their identity in a large degree to the social bonds in their community, in which group goals are more important than the interest of the individual (Hofstede, 1984; House, 1994; Yang et al., 2014). It can be considered to be the opposite of individualism, the two forming a spectrum of the relative importance of the individual vis-à-vis the community. While the body of rules that make up the communitarian informal institution are broad and complex, we will focus on three key aspects that in our view are particularly relevant for firm-level innovation behavior: conformity (Erez and Nouri, 2010), informal insurance (Fafchamps, 1999) and ‘pay-it-forward’ behavior (O’Brien and David, 2013).

2.2: Communitarianism and innovative activities: The role of conformity

Individual behavior is strongly influenced by social factors of reputation, status or acceptance (Bernheim, 1994). Social groups often penalize individuals disproportionally, even for rather small infringements against established norms (Akerlof, 1980). As such, individuals do not just care about intrinsic classical utility derived from consumption, but also about their social status. The degree of conformity depends on the relative importance of utility derived from status versus intrinsic utility. When status is relatively important, individuals will typically suppress their own heterogeneous intrinsic preferences over group preferences (Bernheim, 1994). By definition, highly communitarian contexts are therefore characterized by a high degree of conformity (Erez and Nouri, 2010), whereas more individualistic contexts value uniqueness (Goncalo and Staw, 2006).

Conformity is intrinsically linked to innovation. We know from organizational research that organizational change and improvement can happen through both experimentation and imitation (Levitt and March, 1988). However, conformity through strong group embeddedness is particularly associated with a focus on imitation, at the expense of reduced time and attention for experimentation and exploration (Pech, 2001), which are essential antecedents of innovation. Moreover, experimentation is socially risky as both its process and possible outcomes potentially exposes individuals as standing out from existing norms. This relationship is confirmed by recent empirical research.
Comparative organizational research has shown that strong conformity and organizational identification is linked with strong routine performance, not with incremental or radical creativity (Madjar et al., 2011). Similar country-level research has also shown that societies with a high level of communitarian institutions, are associated with lower prevalence of innovation behavior (Shane, 1993; Taylor and Wilson, 2012).

We therefore hypothesize a negative direct effect of communitarianism on propensity to engage in innovation activities serving as a baseline hypothesis before exploring the moderating role of communitarianism on performance feedback, our main focus.

**Hypothesis 1.** (conformism): *Firms operating in highly-communitarian contexts have lower overall engagement in innovation activity.*

### 2.3. Communitarianism and problemistic search: The role of informal insurance

The concept of problemistic search, or search induced by a specific problem, was identified as one of the main features of the Behavioral Theory of the Firm in Cyert & March’s seminal work (1963), and further extended into a more formal framework as negative performance feedback (Greve, 2005). It is built on the main premise that firm managers are not rational optimizing agents that efficiently pursue opportunities, but rather are satisficing agents that will typically not take risks when the firm’s aspirations are met. This mechanism is directly linked to risk preferences, as prospect theory (Kahneman and Tversky, 1979) predicts that individuals are indeed more likely to take risks when they are in loss territory. In the case of negative performance feedback, firm managers at such are more willing to engage in risky search, for instance investment in new R&D projects, when they are faced with a performance shortfall which they want to address. It is, however, important to note that sufficient access to resources is an important precondition for this behavior, as the risk of additional spending threatening firm survival should not outweigh the potential for performance improvement (Audia and Greve, 2006). As such, the baseline prediction is that negative performance induces innovation activities, provided there are sufficient internal resources available.

Modified risk preferences and different strategies of resource access are defining features of communitarianism through the mechanisms of informal insurance. Informal insurance refers to the (unwritten) shared expectation that community actors share their resources with those in need. While similar terms such as quasi-credit (Fafchamps, 1999) or reciprocity (O’Brien and David, 2013) are also used to describe the same phenomenon, we prefer the term informal insurance as it stresses the inherent *conditional* nature of the resource exchange, which is only available to those in need. These informal insurance practices have been observed in firms in various communitarian contexts, in both poor and rich countries. For instance, a study investigating resource sharing between leather shoe manufacturing firms in Ethiopia showed that firms regularly access financial and tangible resources of other firms on a reciprocal basis, and that kinship ties generally strengthen such type of resource sharing (Tuffa Birru, 2011). Communitarian networks linked to ethnicity are known to generally facilitate such soft loans (Aldrich and Waldring, 1990). Abraham and Platteau (1987) described quasi-credit arrangements in the Indian fishing sector, where short-term, interest-free loans were given to pool risks, with flexible and state-contingent repayment dates. Japanese firms experiencing tough times are supported by lenders with lower interest rates, and suppliers are willing to offer more favorable terms (Lincoln and Gerlach, 1996). It is important to note that such informal insurance does not exclude formalized relationships between firms and other actors, in fact the informal insurance is often an add-on to formal contracts. This add-on takes the shape of an implicit arrangement between parties to renegotiate the terms of the explicit contract, either by forgiving part of the debt or by postponing contractual compliance (Fafchamps, 1999).

The informal insurance mechanism does not just take place between firms, but also between firms and other actors, including family members. Communitarian societies are generally characterized by more diffuse boundaries between the firm and the firm environment (George et al., 2016c). Firm owners have a duty of care towards (extended) family members, often even of employees, and are called upon to support members of these families in case of need. Reversely, firm owners may call on their family (Amaeshi et al., 2006; Limbs and Fort, 2000) and wider community or ethnic ties (Karra et al., 2006) to support them through difficult times and employees are expected to be willing to reduce their salaries (Lincoln and Gerlach, 1996). The unwritten rules and practices around informal insurance tends to be stable and self-enforcing, as communitarian contexts are characterized by high-density networks between individuals. These high-density networks, combined with strong sanctions in terms of damage to a person’s reputation (Gargiulo and Benassi, 2000), makes the risk of moral hazard much lower (Bloch et al., 2008; Coleman, 1988). This latter finding was confirmed through behavioral research, which found that people living in a communitarian country were more likely to repay legally non-enforceable loans than in non-communitarian countries, even when stakes were high (Cappelen et al. 2014).

This informal insurance, or *state-conditional resource sharing*, has been shown to directly affect risk preferences of individuals. Based on a comparative analysis of Chinese and Americans risk preference, Hsee & Weber (1999) found that Chinese respondents were considerably more likely to take financial risks compared to Americans. The reasoning behind this effect centers around the principle that individuals in communitarian contexts know that they can rely on their community in case the financial risks actually materialize, thereby putting a floor in a loss situation. This ‘cushion effect’ was subsequently confirmed in other studies and contexts as well (Schneider et al., 2015; Tavor and Garyn-Tal, 2016). It is important to note that individuals are only more risk-seeking in the domain of finance, and not so for other types of risks (such as medical procedures), strengthening the case for resource-sharing character of communitarian settings as the main explanation for this observation.

Based on the above, we see a clear moderating role of communitarianism on the performance-innovation relationship. The informal insurance and resulting risk preferences have direct implications for the negative performance feedback mechanism. The high degree of informal insurance typical of communitarian contexts decreases the weights of losses in the risk evaluation due to the floor provided by the cushion effect, inducing more risk-seeking behavior such as innovation activities. Moreover, the increased access to resources also provides the means to engage in additional investments. As such, when firms in highly communitarian firm environments receive negative performance feedback, they are on average *more willing and capable* to engage in problemistic search, such as the investment in R&D projects that could potentially lead to solutions to address the firm’s performance shortfall.

**Hypothesis 2.** (Cushion Effect): *Firms in a highly communitarian context are more likely to engage in innovation activities in negative performance feedback situations.*

### 2.4. Communitarianism and slack search: The role of ‘pay-it-forward’

The behavioral theory of the firm has also identified a corollary of the problemistic search mechanism when performance is above aspiration levels – positive performance feedback - in the slack search mechanism. Organizational slack refers to a ‘buffer’ (Bourgeois, 1981) or a level of resources above the minimum firms need to produce a certain output (Nohria and Gulati, 1996). The effect of such slack has been heavily debated since its original identification (Cyert and March 1963). On the one hand, organizational slack enhances innovation activities as it allows organizations to invest in inherently uncertain outcomes of innovation pursuits due to lower aggregate risk to the organization, and it also typically relaxes control over managers to pursue their personal interests. On the other hand, slack also means a reduced stakeholder equity, making it a potentially risky behavior. In highly communitarian contexts, stakeholders are more likely to take advantage of slack to dole out added resources (Lincoln and Gerlach, 1996). The unwritten rules and practices around informal insurance tends to be stable and self-enforcing, as communitarian contexts are characterized by high-density networks between individuals. These high-density networks, combined with strong sanctions in terms of damage to a person’s reputation (Gargiulo and Benassi, 2000), makes the risk of moral hazard much lower (Bloch et al., 2008; Coleman, 1988). This latter finding was confirmed through behavioral research, which found that people living in a communitarian country were more likely to repay legally non-enforceable loans than in non-communitarian countries, even when stakes were high (Cappelen et al. 2014).

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projects (Bourgeois, 1981). On the other hand, in a situation of too much slack, the associated loss in discipline may lower the quality of innovation projects to such a degree that the total innovation outputs suffer (Nohria and Gulati, 1996). However, in both situations the literature finds a clear positive relationship between discretionary slack and R&D, despite some of this R&D being ‘irresponsible search’ (Levinthal and March 1981).

As we have seen in our discussion on the problematic search mechanism above, a key salient feature of communitarianism is the presence of informal insurance mechanisms, or state-dependent reciprocity. In the case of slack, the social contract works the other way. Companies have a duty to share their surplus with their stakeholders, including value chain partners, family, kinship networks and the wider local community. Given the high density of information networks in communitarian settings as described above, and the associated lower risk of moral hazard, managers have fewer options to privatize the slack through higher dividend payouts or salaries. As such, a larger share of the resources have to be spent on discretionary expenses that fulfill the informal institutional norm of ‘giving back’ (O’Brien and David, 2013).

Giving back, however, can take several forms. First, companies can give cash payouts to shareholders through lower prices, higher wages and bonuses. However, this has the disadvantage of raising expectations, as prices and wages are notoriously sticky due to nominal rigidity (Erceg et al., 1999; Keynes, 1936). Given slack is often only a temporary resource due to changing market forces and organizational performance, this is a relatively risky and unattractive strategy.

Second, firms often carry out Corporate Social Responsibility activities such as sponsoring local associations and events, volunteering, or charity actions (Kechiche and Soparnot, 2012). Engaging in CSR, is certainly commonly used in communitarian context as it offers very visible ways of supporting a wider community (Amaeshi et al., 2006). However, these kinds of activities are typically aimed at the larger outer ring of stakeholders and conducted through low-intensity engagement, and is less suitable for closer and more strategically important stakeholders such as value chain partners.

Third, companies can invest in new projects (search) that satisfy the giving back aspect through the character of the innovation process and/or intended innovation outcomes (O’Brien and David, 2013). Pursuing innovative projects, does not suffer from the above drawbacks, but offers additional advantages of being mutually advantageous, narratively elastic, building on firm-level competences and having high flexibility. The mutual advantage lies in the fact that R&D is supposed to benefit key business stakeholders and/or the community at large. Yet, there is still a chance that a successful innovation will also generate revenue for the firm. Pursuing such projects is narratively elastic, in that they can be presented either as strategic business investments to certain stakeholders (banks, investors, finance & control departments) or as community investments, depending on the audience (Nekhli et al., 2016). Such projects build on firm-level competences, in contrast to CSR, as firm managers typically have readily available knowledge and skills to identify good pathways for innovation investments, but are not experts in philanthropy. Finally, such projects are flexible (in contrast to direct cash payouts), as they can be downsized or terminated should the organizational slack wane.

In the remainder of this paper, we focus on this third route of ‘pay it forward’. The importance of this strategy is confirmed by recent empirical and theoretical insights on collaborative R&D. Firms using collaborative R&D as a way to strengthen partnerships and solve common challenges in the value chain is a widespread phenomenon (Belderbos et al., 2004), but is in particular relevant for communitarian settings. Recent evidence from Japan has shown that firms with more communitarian governance principles use R&D-collaboration where the firm with slack takes the investment lead as ways to ‘pay back’ their main stakeholders and business partners (Lincoln and Gerlach, 1996; O’Brien and David, 2013). From research on grassroots innovation (Fressoli et al., 2014; Smith et al., 2014), social innovation (Pel et al., 2020; van der Have and Rubalcaba, 2016), inclusive innovation (Pansera and Owen, 2018) and frugal innovation (Bhatti et al., 2018; Brem and Wolfiram, 2014; Ploeg et al., 2021; von Janda et al., 2020), we know that firms in communitarian settings often take on the responsibility to address local societal challenges through innovation projects. Conversely, firms in non-communitarian institutional settings may instead opt to award high incidental managerial compensation in case of financial slack, a pattern indeed observed in the literature (Pennings, 1993).

Combining the extant findings of positive performance feedback and slack search with the mechanism of ‘paying back through R&D’ prevalent in communitarian settings, we formulate our third hypothesis with communitarianism being a positive moderating force for slack search.

**Hypothesis 3.** (Pay it Forward): Firm in a highly communitarian context are more likely to engage in innovative activities in positive performance feedback situations

2.5. Embeddedness

Although all firms sharing a specific locale technically operate in the same context, the degree to which a firm’s environment affects their behavior varies. Firms and their managers have different degrees of embeddedness in their context reflecting the extent to which they are ‘rooted in the land’ (Whiteman and Cooper, 2000), as well the extent to which actors have ties to other local actors. Both are linked to positive and negative incentives strongly embedded firms face in terms of adhering to local social rules (Uzzi, 1996), such as communitarianism. On the positive side, strongly locally embedded firms benefit from stronger organizational networks, thereby promoting economies of time (the ability to reach quick agreements) as well as integrative agreements (looking beyond short-term specific contracts at long-term relationships), boosting their performance (Uzzi, 1997). Such organizational networks and relationships require a tight degree of relational and social integration, therefore implying that firms need to be highly compliant to the locally dominant social contracts, including those of informal institutions if they want to benefit from these positive factors (Kirkman et al., 2006).

From a negative incentive perspective, rootedness in the land affects whether firms have an ‘outside option’, such as displacement of economic activities to other contexts. Firms that are highly locally rooted have high stakes in adhering to local social rules, as nonconformity may result in long-lasting reputational damage potentially affecting both the firm’s demand and supply side with no alternative course of action.

Less embedded firms, such as those owned by foreign stakeholders or multinational corporations, tend to be much less exposed to both incentives. In terms of benefitting from embeddedness in local networks, multinational firms are much less flexible to adapt to local organizational practices (Newburry and Yakova, 2006), following approaches from their originating countries, or a hybrid form (Lopez-Duarte et al., 2016). Similarly, multinational firms are less critically dependent on local reputation in one market compared to completely rooted firms, having an ‘outside option’. If firm managers are less bound to the social rules of communitarianism due to being weakly embedded, the cushion (H2) and pay-it-forward (H3) effects will not apply in a substantial way to these firms.

**Hypothesis 4.** (Embeddedness): The Cushion (H2) and Pay-it-Forward (H3) effects are stronger the more locally embedded firms are.

3. Data and methodology

3.1 Data

We test our hypotheses using a large firm-level dataset across an extensive selection of 56 countries covering a large variation in informal contexts in Africa, Asia, Europe and Latin America. First of all, we use
the World Bank Enterprise Survey (WBES) for our firm-level data on performance and innovation behavior. The WBES is a large, multi-country standardized survey that collects representative firm-level data, particularly in emerging and developing countries. The data includes manufacturing and service firms, but excludes primary and public sectors. We use pooled cross-sectional data from the waves collected between 2010 and 2017. For data on informal institutions, we use the country-level data from the Hofstede Global Insights database. This database, which contains scores on cultural dimensions that follow the Hofstede model (Hofstede, 2001), based on representative employee surveys and/or expert assessment. For additional country-level controls, we used World Bank data at the country level. Finally, we excluded data points where the independent enumerators indicated to not trust the answers given by the respondent. Based on these data sets, we arrived at a total population of 31,860 firms in 56 countries.

3.2 Measures

3.2.1. Dependent variable

Descriptive statistics for all measures are available in Table 1. Our main dependent variable, engagement in innovation activity, is a measure whether firms have engaged in any formal or informal R&D in the three years preceding the interview. This is a binary variable, unlike the continuous R&D spending shares which are commonly used in performance feedback analysis. While R&D spending data is available for a number of countries in the World Bank Enterprise Survey dataset, this measure suffers from a high degree of missing and unreliable values (extremely high or extremely low). This is likely due to the fact that many firms in developing and emerging countries, particularly smaller ones, do not formally track R&D expenditure. In addition, R&D efforts are often related to effort of staff instead of cash spending, which is also more difficult to translate to a monetary value. As such, we have chosen to simplify the measure to a binary measure and predict the likelihood of engaging in R&D instead of the R&D-intensities. Note that minor variations exist in the wording of the questions around R&D-activities between countries. Some countries distinguish between informal and formal R&D, whereas others ask for external or internal R&D expenditures. Our measure includes any form of R&D for a specific form, but these different wordings have a slightly different scope. Direct country-to-country comparisons of absolute levels of engagement in innovation activity are therefore not valid, and this fact also has implications for the proposed regression models, as presented in Section 3.3.

3.2.2. Independent variables

First of all, we measure firm performance using the sales growth in the last three years before the interview. Sales data is a relatively reliable measure across various settings compared to profit data, which requires detailed data on costs. Sales are a closely monitored indicator by managers to gauge their performance (Gaba and Joseph, 2013; Joseph and Gaba, 2015; Lucas et al., 2018), and may be the most available measure for managers operating in contexts where a lack of detailed bookkeeping and accounting makes following Return on Assets or Return on Sales more difficult. Since performance feedback is measured relative to an aspiration point, we apply the growth compared to a historical comparison of three years prior to the interview and benchmark this against other firm’s performance over the same period, obtaining a peer performance feedback measure. Growth rates were winsorized at 500% increase or 80% decrease respectively. The benchmark is calculated as the mean performance of other firms operating in the same industry in the same country and year. We then separated the performance feedback measure into two splined measures for positive and negative performance feedback. This approach allows for the estimation of separate effects for positive and negative performance feedback and is common in performance feedback studies (Posen et al., 2018). As is typical for splined measures, we use the absolute values for both negative and positive performance feedback in order to facilitate interpretation.

The data on communitarianism is measured using data from the Hofstede Global Insights dataset, most recent online edition. While the definitions and data used in the Hofstede database have faced criticism, they are generally considered to be the most complete and useful source for country-level cultural or informal institutions (Alesina and Giuliano, 2015). Note that, in line with our theoretical framework, we focus on a measure representing the average level of these informal institutions within the region, rather than company-specific measurements, since our theoretical mechanisms rely on the relationship between firms and their environment (workers, suppliers, financial service providers) in their response to performance feedback. The measure taken from this database has a scale between 0 and 100, which has been normalized for our regression analysis.

We measure embeddedness by the share of foreign ownership in firms. Given our already complex model in terms of interactions, we use a split-sample analysis for embedded and non-embedded firms. Embedded firms are considered those with a foreign ownership share of less or equal to 25%, non-embedded those with higher foreign ownership. This cut-off point was chosen as it represents a sizeable ownership share where foreign control or strong influence is exceedingly likely. We ran several sensitivity tests on this particular cut-off point, and the outcomes of our regression results are relatively similar for cut-off points between 5% and 50%. In order to control for variation levels within these segmented group, Foreign Ownership is also included as a linear control variable in all models.

3.2.3. Control variables

In terms of control variables, we control for earlier found factors that influence the performance-innovation relationship, including company size (Audia and Greve, 2006; Camison-Zornoza et al., 2004), firm group status (Castellacci, 2015; Vissa et al., 2010), export behavior (Lopez-Duarte et al., 2016) and sector (Damanpour, 1996; Thakur and Malecki, 2014) as the main control variables, which have all shown to be important predictors for search and innovation behavior. Additionally, we control for an interaction between both positive and negative performance feedback and firm size, as there is evidence that firm size is an important moderator of the performance feedback response (Audia and Greve, 2006; Greve, 2010). For sector, we use a reworked version (Castellacci, 2008) of the original Pavitt sectoral classification (Pavitt, 1984), which also includes service sectors. With this classification models, originally based on underlying innovation patterns, we arrive at

Table 1

Descriptive Statistics (N = 31,860).

| Dependent Variable | mean | sd  | min | max |
|--------------------|------|-----|-----|-----|
| Research & Development | 0.279 | 0.448 | 0 | 1 |
| Independent Variables | | | | |
| Positive Performance Feedback | 0.212* | 0.555 | 0 | 4.860 |
| Negative Performance Feedback | 0.213** | 0.270 | 0 | 1.947 |
| Communitarianism | 0 | 1.000 | –3.292 | 2.277 |
| Firm-level Controls | | | | |
| Company Size | 1.129 | 0.903 | 0 | 3 |
| Export status | 0.175 | 0.380 | 0 | 1 |
| Share of foreign ownership | 0.168 | 0.374 | 0 | 1 |
| Part of larger Firm | 0.0533 | 0.208 | 0 | 1 |
| Recent Innovation Introduced | 0.493 | 0.500 | 0 | 1 |
| Sector (Categorical) | | | | |
| Business Climate | 0.0497 | 0.433 | –1 | 0.872 |
| Business Cycle | 2.195 | 3.990 | –6.886 | 9.300 |
| GDP (PPP) | 9.059 | 0.873 | 6.741 | 10.41 |
| Research & Development Intensity | 0.611 | 0.378 | 0.0570 | 1.912 |
| Rule of Law Quality | –0.236 | 0.499 | –1.823 | 1.433 |
| Government Effectiveness | –0.105 | 0.538 | –2.068 | 1.161 |
| Uncertainty Avoidance | –0.238 | 0.955 | –1.617 | 1.598 |

*0.33 excluding the zero feedback observations; **0.58 excluding the zero feedback observations.
Statistics. Higher total R&D score on the World Bank among citizens, firms and experts. Finally, we include the country features between stakeholders, as they operate in a context where formal institutions (Saka-Helmhout et al., 2020; Weng et al., 2021). Using World Bank data, we include a measure of log-transformed GDP per capita on a purchasing-power parity basis to capture the level of economic development as shown in Fig. 2. We also control for the phase of the Business Cycle by using GDP percentage change between the survey year and the year prior, based on World Bank Data. Extent literature has shown that demand drops due to broad industry-level downturns typically reduces firm’s investment in innovation (Garicano and Steinwender, 2016; Paunov, 2012). Finally, we control for country level R&D Intensity using the gross expenditures on R&D as a share of GDP, based on UNESCO Statistics. Higher total R&D expenditures from businesses and the public sector are likely to be associated with more formal collaboration structures between stakeholders, as they operate in a context where formal R&D, such as external R&D-contracting and use of external facilities, is more common.

In addition to macroeconomic variables, we know from comparative institutional research the importance of the joint configuration of both formal and informal institutions when interpreting their effects on managerial behavior (Brockman et al., 2018; Stephan et al., 2015). In terms of formal institutions, we include country ratings on Rule of Law and Government Effectiveness from the World Wide Governance Indicators, based on an aggregation of sources from a variety of surveys among citizens, firms and experts. Finally, we include the country’s score on the World Bank’s Doing Business Reports as an aggregate measure to represent a country’s business climate, in particular in areas of licensing, corruption, property right protection etc. These are specific formal institutions that are highly relevant for firms and their innovation behavior (Olouwotobi et al., 2015). All three formal institution measures are normalized and signed in such a way that higher scores mean better institutions. Finally, we also control for Uncertainty Avoidance, an important factor for uncertainty-related decisions such as pursuing innovation (Townsend et al., 2018), which is sourced from the same Hofstede Insights Database and included after normalization.

3.3. Models

Given that our analysis combines measures at the firm-level and country level, and we are interested in measuring the moderating effect of the country-level measures on the likelihood of positive and negative performance resulting in engagement in innovation activity, a multilevel analysis is the most appropriate. A multilevel analysis allows not just measuring the moderation effect by allowing for different slopes through interaction effects, but also estimates different intercepts for regression equations. This is an important feature for our analysis, as absolute differences in engagement in innovation activity propensities of firms due to structural differences or measurement variations could bias the results otherwise. In addition, a multilevel approach also addresses the otherwise problematic clustering of errors that is due to the shared country-level variables at the firm-level. Also, as a precaution, a missing values analysis on the dependent variable (R&D) was carried out through a probit regression of missing value status on all firm-level independent and control variables. We find only 3.9% of dependent variable values missing, with no significant effect of key independent variables such as performance, with only the sector and firm-size control variable showing a significant effect.

Our models are based on multilevel probit estimations, given the binary dependent variable. By creating separate variables for both positive and negative feedback, we mirror the typical splined regressions that is commonly used in performance feedback models (Greve, 2003) to independently measure the effect of positive and negative feedback respectively.

We estimate three main models. Model A is a baseline multilevel model, including the firm-level and firm-environment level controls, as well as a direct effect of communitarianism. Model B is a baseline model including performance feedback, as well as an interaction term between performance feedback and firm size. Finally, Model C1 is the full model, including all the full performance feedback model combined with interaction terms for communitarianism. Model C2 and C3 are the same full models, analyzed using the embedded firms segment (C2) and non-embedded firms segment (C3) respectively.

Before finalizing the models, we ran a correlation analysis on all dependent, independent and control variables in order to check for multicollinearity. The results (see Annex Table 1) show that all correlations are weak, except a number of country-level measures among themselves, which is typical due to the multi-level design, and none approach the level at which multicollinearity becomes problematic.

4. Results

4.1 Main results

The multilevel regression results of our main results are presented in Table 2. Model A is the baseline model with control variables, with Model B also including the control interaction effects between performance feedback and firm size. Model C1 shows us the results of the full model testing our hypotheses on the interaction effect of communitarianism and performance feedback. Given the difficulty interpreting the compounding effect of multiple interaction effects, we have also carried out a marginal effects analysis for both negative performance feedback (Fig. 2) and positive performance feedback (Figure 3), based on our main model (C1). For Negative Performance Feedback, we calculate the marginal effects for the values indicating no feedback (0), mean feedback (0.33), +1 sd (0.6), +2 sd (0.87) and +3 sd (1.14), and maximum value (1.95). For Positive Performance Feedback, we similarly calculate the marginal effects for the values indicating no feedback (0), mean feedback (0.58), +1 sd (1.38), +2 sd (2.28) and +3 sd (3.08), and maximum value (4.98). For these feedback marginal values, in both cases, we base these on the set of firms actually receiving feedback (so excluding 0). For Communitarianism, we calculate the marginal effects at the mean value (0), (−1) and (1) sd, and minimum (−3.2) and maximum (2.27) values.

First, while we indeed find a negative effect of communitarianism on engagement in innovation activity, the effect is not significant. We therefore reject H1 in favor of the null hypothesis. Second, the results show that communitarianism has a positive moderation effect on negative performance feedback, thereby accepting Hypothesis 2 for the cushion effect. As can be seen in Fig. 1, we can confirm that the effect is substantial in economic terms. A firm receiving strong negative feedback (+2 sd) operating in the least communitarian setting has a typical R&D-propensity of 11.1% compared to 19.6% in the most communitarian setting.

We also find clear evidence for a positive effect of communitarianism
on positive performance feedback, thereby accepting Hypothesis 3 (Pay it Forward) for our main model. For Positive Performance Feedback, we see in Fig. 2 equally substantial differences with a propensity of 12.3% for low communitarian settings and 25.9% for high-communitarian settings.

Finally (model C2 and C3), we find that H2 and H3 only hold for embedded firms, and not for non-embedded firms, thereby accepting Hypothesis 4 (Embeddedness).

In terms of control variables, we find that firm size is a highly significant positive predictor of innovation activities. We also find

Table 2
Main results.

| A Baseline | B PF Model | C1 Main | C2 Embedded | C3 Non-Embedded |
|------------|------------|---------|-------------|-----------------|
| Communitarianism | 0.004 | 0.004 | −0.023 | −0.020 | −0.062 |
| Positive Performance Feedback | −0.009 | −0.018 | −0.016 | −0.212*** |
| Negative Performance Feedback | −0.193** | −0.214*** | −0.212*** |
| Community * Positive PF | 0.045** | 0.052** | 0.008 |
| Community * Negative PF | 0.087** | 0.149 |
| Small Firm (10–49) | 0.216*** | 0.153*** | 0.150*** |
| Medium Firm (50–249) | 0.404*** | 0.319*** | 0.316*** |
| Large Firm (250+) | 0.577*** | 0.467*** | 0.468*** |
| Small Firm (10–49) * Positive PF | 0.097** | 0.100** | 0.094** |
| Medium Firm (50–249) * Positive PF | 0.076 | 0.077 | 0.072 |
| Large Firm (250+) * Positive PF | 0.196*** | 0.194*** | 0.229*** |
| Small Firm (10–49) * Negative PF | 0.151* | 0.160* | 0.134 |
| Medium Firm (50–249) * Negative PF | 0.313*** | 0.320*** | 0.355*** |
| Large Firm (250+) * Negative PF | 0.335** | 0.329** | 0.323* |
| Firm Level Controls | YES | YES | YES | YES |
| Firm Environmental Controls | YES | YES | YES | YES |
| Country-level effect (multilevel) | YES | YES | YES | YES |
| Observations | 31,860 | 31,860 | 29,758 | 2102 |
| Number of groups (Countries) | 56 | 56 | 56 | 56 |
| Akaike’s Information Criterion (AIC) | 26,310 | 26,288 | 26,284 | 24,028 |
| Wald Chi-2 | 4594 | 4620 | 4625 | 282.6 |
| PF = Performance Feedback. *** (p<0.01) ** (p<0.05) * (p<0.1). |

Fig. 1. Negative Performance Feedback Marginal Effects.
confirming evidence that the performance feedback is strongly affected by firm size for both positive and negative performance feedback. In terms of Sector, Science Based Manufacturing Sectors, unsurprisingly, are associated with a higher degree of engagement in innovation activity compared to other sectors as well. Firms that export directly and those that are part of larger firms also see higher R&D-propensity levels. Finally, firms that introduced innovations in the recent past are also much more likely to engage in R&D as well.

4.2. Robustness analysis

We implemented a number of additional robustness models in order to further strengthen the validity and reliability of our main model findings (C1), presented in Annex Table 2. First, model R1 presents an alternative specification using just historical performance feedback, without the peer benchmark, which is also a commonly used performance feedback measure. Similar to the main model which uses peer feedback, it is calculated as the growth rate of sales between three year prior and the date of the interview, winsorized at the 50% increase or 80% decrease levels. Model R2 presents a model that includes a possible confounding factor, long-term vs. short-term orientation (LTST), as a factor in determining performance feedback behavior (Smulowitz et al., 2020). It is defined as the time-orientation of specific cultures. We use the composite, country-level scores ranging from 0 (fully short-term orientation) to 100 (fully long-term orientation) from the Hofstede Global Insights database, which were subsequently normalized. This data is only available for a limited number of countries, and hence not implemented in our main model. Model R3 carries out a similar model on an alternative dataset, the European Company Survey (ECS), in order to verify if the results also hold in higher income settings and in a sample with even more variation in communitarianism levels. We use the third wave of the ECS, a representative sample survey of firm performance, strategy and human resources profiles organized in 32 European countries organized by EUROFOUND. The data set includes both manufacturing, service and public organizations, the latter were excluded to arrive at a similar scope of our main WBES sample. This dataset has more limitations in terms of available measures, in the particular binary performance feedback measures and fewer available control variables. Model R4 presents a combined data set of ECS and WBES data, using the binary feedback measures and limited control variables, covering a total of 71 countries. Finally, we use two proxy measures with data from the World Values Survey (WVS) instead of the Hofstede Global Insights Database, in order to validate that the found effects do not overly rely on the measures used for communitarianism. In the WVS, the degree of communitarianism is measured with the survey question that asks respondents ‘whether they see themselves as part of their community’, with answers ranging from strongly disagree to strongly agree. A number of missing values for not-included countries were imputed using a regression analysis that included geographical variables, formal institutions and levels of economic development. After normalization, we calculated average values at the level of each country, which represents the overall degree of communitarianism.

Finally, it is interesting to note that we do find some evidence for the direct effect of communitarianism on R&D-propensity (H1) in the combined model with the largest numbers of countries (R4), as well as the model with LTST (R2) included. This is potentially explained by the fact that we cannot control for embeddedness in these samples, as we have no data on foreign ownership. Overall, we find solid confirmation of our hypotheses using these five robustness models, in particular for the cushion effect hypotheses (H2), which is significant in models R2-R5 (and close to significant in R1). For the ‘pay-it-forward’ hypothesis (H3), we find strong confirmation in the robustness models based on our existing dataset (significant in R2 and close to significant in R1), but not so for the combined data set (R3-R5). This can be explained by the fact that we cannot control for embeddedness in these samples, as we have no data on foreign ownership. Finally, it is interesting to note that we do find some evidence for the direct effect of communitarianism on R&D-propensity (H1) in the combined model with the largest numbers of countries (R4), as well as the model with LTST (R2) included. This is potentially explained by the fact that the R4 and R2 models have a different selections of countries, with therefore more variation in the communitarianism variable. While the selection of countries seems to have limited impact on our firm-level hypotheses (H2-H4), it does seem to impact our country-level hypotheses on the aggregate effect of communitarianism levels (H1). Since all our main and robustness models except the baseline models A and B show a negative relationship, with some of the robustness models a significant results, we can conclude there is preliminary but not yet conclusive evidence for this effect.

5. Discussion

Our findings clearly show that communitarianism not only has a large direct effect on firm’s propensity to engage in innovation activities, but also plays an important moderating role in the performance feedback responses, albeit mostly for locally-embedded firms. This has a number of implications for the wider field of performance feedback and innovation.

![Fig. 2. Marginal Effects Positive Performance Feedback.](image-url)
First, the finding that communitarianism can have a decisive impact on the net response to performance feedback, provides a clear way forward to address a substantial part of the empirical inconsistencies in the current performance-innovation literature (Posen et al., 2018). While often theorized (Gavetti et al., 2012; Greve and Teh, 2018), but to our knowledge not empirically studied, this study demonstrates that including firm environmental factors, such as formal and informal institutions, is important when these institutions’ behavioral implications have direct connections to the underlying mechanisms of the performance-innovation relationship, such as risk preferences, resource access, and resource allocation. In the case of communitarianism, we show that informal insurance and ‘pay-it-forward’ are two such behaviors. Informal insurance moderates the financial risk preferences of individuals through the presence of a safety cushion and increases access to resources when dealing with a negative financial situation, thereby inducing problemistic search. ‘Pay-it-forward’ affects slack search, as it affects resource allocation in case of slack, leading to greater slack search investments as firms seek to repay their stakeholders through innovation activities. Future studies could look into the role of other formal and informal institutions, their joint configuration (Weng et al., 2021) and possible substitution effects between formal and informal institutions (Saka-Helmhout et al., 2020) in moderating the performance-innovation relationship.

Second, this study has relevant implications for the study of challenge-oriented innovation (George et al., 2016b). Our study further highlights that in many instances firm borders are rather porous, and that innovation often happens in ecosystems that tie together firms, other firms and other stakeholders such as local communities. Because of the informal insurance models used by firms, these systems have much larger resilience in the face of challenges, in particular idiosyncratic firm-level shocks than one would expect looking at an individual firm’s balance sheet. These findings are in line with the recent stream of research on the relevance of open innovation and open R&D (Chesbrough, 2003; Dahlander and Wallin, 2006; Enkel et al., 2009), which might be particularly relevant for communitarian settings after further study. These results also show that communitarian context are likely to be a fertile ground for the new waves of community or society-oriented corporate governance practices (Boon and Edler, 2018), where firms use innovation to address societal challenges in order to be a good ‘corporate citizen’ (Carroll, 1998; Matten and Crane, 2005) or ‘stakeholder capitalistic’ (Freeman et al., 2007) as well as an investment tool for future revenue opportunities. Importantly, our study has shown that it is essential to incorporate embeddedness when discussing the relationships between firms and their environments.

The first two contributions point to a wider challenge in the innovation literature. Despite regular calls for diversification, the large majority of firm-level studies on innovation are done on a very narrow scope of firms: publicly-listed Western - often US - firms (George et al., 2016a). This study shows that a wider empirical lens indeed brings out new theoretical insights, as variation in context forces us to unveil hidden axioms and consider their validity for other types of firms in different environments. In our case, looking across a wide range of countries in terms of their degree of communitarianism, we showed that the risk preferences and resource access and allocations underlying the problemistic and slack search mechanism work differently in different contexts. This implies that a more direct focus on the underlying behavioral mechanisms of innovation decision making such as goal formation, risk preferences, decision processes etc., rather than ‘black-boxing’ these processes, would be highly productive and in line with the general direction of the field (Posen et al., 2018).

Finally, in addition to its theoretical and empirical contribution, these results also have practical implications for practitioners and policy makers alike. Policy makers directly or indirectly engaged in stimulating innovation should be aware of the relatively strong influence of communitarianism on innovation behavior. In highly communitarian countries, since overall innovation rates are lower, yet problematic search due to negative performance feedback is found to be very strong, innovation support instruments could be geared to support problem-driven R&D. These could be relatively small yet rapidly accessible funding sources such as innovation vouchers, or facilitated access to technical expertise (such as a competence center). Similarly, for the slack search ‘pay-it-forward mechanism’ found in highly communitarian contexts, policy makers could clearly communicate local societal challenges or missions in order to guide firms where they can best contribute (Brown, 2020; Mazzucato, 2018). Vice versa, in low communitarianism settings, policy makers could mitigate the relative decrease in R&D-investments during positive or negative performance feedback by robust continuation of innovation support measures even in economic downturns. Policy makers should also be aware of the distinction in innovation strategies between embossed and non-embossed firms, and design tailored innovation support strategies for both groups. Firm managers themselves, when operating in highly communitarian contexts and faced with a performance shortfall, should try to make the best of the situation by using the opportunity of community-supported innovation activities (‘the cushion’) as strategically as possible. This could be done by focusing the R&D on realizing sustainable or productivity-enhancing solutions to the problems causing the shortfall, instead of finding a ‘stop-gap’. Similarly, in good times, the ‘pay-it-forward’ innovation activities could be used as strategically as possible, and firm managers should make sure to be in tune with their stakeholders most relevant needs in order to increase the chance of effective innovation results. In low-communitarian countries, there are few direct strategic implications of our findings for firm managers. Yet, they should keep a strategic portfolio view of R&D-activities, so that potential cuts to R&D-spending during negative performance feedback scenarios can be focused on low priority innovation activities.

This study is subject to a number of limitations. First of all, our research is constrained by the lack of measures around the degree of alignment with informal institutions at the firm-level. While our analysis of the role of embeddedness shows that alignment indeed is critical for observing the communitarian mechanisms, a fuller analysis of role of heterogeneity in the discrepancy between firm and firm-environment level norms would be of added value. Second, our dataset is constrained by data availability over time. A panel data set could allow for more precise estimations of effect sizes, but also explore the dynamic effects of peer feedback in various institutional contexts, which recently was found to have a significant role (Yu et al., 2019). Together with our main message of the confirmed relevance of more broadly studying the role of informal institutions in determining innovation behavior, these aspects provide interesting avenues for further research.

Credit roles

Matthias Ploeg: Conceptualisation, Methodology, Formal Analysis, Investigation, Data Curation, Writing – Original Draft, visualisation, Project Administration.

Joris Knoben: Conceptualisation, Methodology, Writing – Review & Editing, Formal Investigation, Project Administration

Patrick Vermeulen: Conceptualisation, Methodology, Writing – Review & Editing, Project Administration

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
Appendix A. Additional tables

Table 1
Correlation table.

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R&D       | 1.000 |
| Positive PF | -0.014 | 1.000 |
| Negative PF | -0.100 | -0.301 | 1.000 |
| Communitarianism | -0.152 | 0.046 | 0.095 | 1.000 |
| Firm Size | 0.277 | -0.063 | -0.117 | 1.000 |
| Export Status | 0.171 | -0.027 | 0.345 | 1.000 |
| Foreign Own. Share | 0.026 | -0.012 | 0.110 | 0.156 | 0.204 | 1.000 |
| Part of larger Firm | 0.144 | -0.014 | -0.024 | -0.019 | 0.237 | 0.126 | 0.114 | 1.000 |
| Innovation Introduces | 0.444 | 0.012 | -0.050 | -0.016 | 0.240 | 0.156 | 0.064 | 0.124 | 1.000 |
| Business Climate | -0.065 | 0.277 | -0.023 | 0.027 | -0.052 | -0.167 | -0.166 | 1.000 |
| Business Cycle | 0.282 | -0.055 | -0.137 | -0.181 | 0.231 | 0.016 | -0.063 | 0.206 | -0.102 | 1.000 |
| GDP PPP | -0.084 | -0.015 | -0.283 | -0.043 | 0.061 | -0.067 | -0.125 | -0.174 | 0.798 | -0.115 | 1.000 |
| Rule of Law Quality | 0.063 | -0.053 | -0.111 | -0.354 | 0.026 | 0.064 | -0.026 | -0.032 | -0.045 | 0.507 | 0.016 | 0.385 | 1.000 |
| Government Effectiveness | -0.036 | -0.077 | -0.269 | 0.041 | 0.082 | -0.035 | -0.089 | -0.124 | 0.788 | 0.026 | 0.754 | 0.806 | 1.000 |
| Uncertainty Avoidance | -0.223 | 0.044 | 0.092 | 0.015 | -0.185 | -0.014 | -0.110 | -0.193 | 0.405 | -0.416 | 0.622 | 0.253 | 1.000 |
| R&D intensity | 0.108 | -0.024 | -0.052 | -0.465 | 0.052 | -0.110 | -0.093 | 0.583 | 0.259 | 0.530 | 0.322 | 0.504 | 0.113 | 1.000 |

Note: Models R3, R4 and R5 use binary measures for Positive and Negative PF based on historical performance feedback measures. PF = Performance Feedback. *** (p<0.01) ** (p<0.05) * (p<0.1).

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