Interplay of Not Invented Here Syndrome, External Social Capital and Innovation Climate

Abstract

In spite of having consensus over the negative relationship between individual's biased attitude towards externally generated ideas and the applicability of open innovation as a strategy, we find gap in the literature regarding how individual unwillingness - NIHS (Not Invented Here Syndrome) actually impacts innovation performance achieved through collaboration, and what management tools are available to counter it. This study addresses these two questions by testing the relationship between NIHS and innovation performance and the impact of innovation climate as a way to contain this negative attitude. Based on the quantitative survey data collected from 250 firms across France, Italy, Spain and Sweden, we are able to confirm that innovation climate is a useful management tool to contain NIHS, by opening individuals towards external ideas, ultimately helping firms to improve their innovation performance through collaboration. Most interestingly, we also find that the impact of NIHS on innovation performance achieved through collaboration is mediated through external social capital rather than having a direct impact.

Keywords: Not-Invented-Here Syndrome, Innovation Climate, External Social Capital, Open Innovation.

1. Introduction

The exponential rise in use of technology is constantly changing the business environment and challenging the status quo of organizations. Despite the decade long research work to answer the question of 'how can a business stay competitive in such a dynamic environment', the issue remains open and relevant as it was a decade ago (Dahlander and Gann, 2010; Dahlander, Gann and Wallin, 2021). One commonly discussed approach to tackle this challenge is the open innovation (OI) practice, which promotes the use of both internal and external ideas (Chesbrough, 2003). Under this approach, the firm permits ideas to flow in and out of its boundaries, and leverage on the combined knowledge rather than what it generated in silo to stay abreast and sustain its competitive advantage. Alongside the benefits associated with OI, the literature also discusses the noticeable challenges faced in implementation of OI as a practice. These challenges can vary from constraints in form of regulatory issues to the high costs associated with adoption of external ideas (Garriga et al., 2013; Cassiman and Valentini, 2016).

Although individuals have a central role in the success of OI as a practice (Salter et al., 2014), most of the research has focused on organizational factors and little is known of challenges associated with individuals', and how their attitude can shape the success or failure of OI (West et al., 2014). This issue has aptly been discussed in one of the recent study carried out by Dahlander et al., (2021), who briefly points towards the ongoing struggle by firms to source and internalize ideas generated outside its boundaries.

Recalling the seminal work of Cohen and Levinthal, (1990), we find a substantial portion of discussion on the relation of individual and firm level capacity to take in ideas from outside of its boundaries. Since the ability of individual receivers to 'recognize' and 'assimilate' external knowledge is one of the impediments of firm's ability to absorb external ideas and use them for innovation (Minbaeva, 2005). This implies that a firm's ability to recognize and adapt idea to make its in-bound OI strategy succeed, is partly dependent on the individuals who act as interface between the firm and its environment.

Contribution of individuals is not limited to being mere receptors of knowledge, they are also responsible for gate-keeping, i.e. to accept or reject and further carry knowledge from outside the boundaries to inside of the firm (Enkel et al., 2017). However sometimes, these gate-keepers may systematically reject new ideas on basis other than its validity, which may be detrimental to the firm performance. This act of individual being biased is explained through the psychological phenomenon known in the literature as Not-Invented-Here Syndrome (NIHS) (Katz and Allen, 1982). NIHS is formally defined as *"as an individual's negative attitude towards knowledge that originates from a different field of expertise, from another organizational entity, or from another geography, and thus, is considered 'outside' or 'external' to the group(s) or organization(s), in which the individual is embedded"* (Hannen et al., 2019). This biasness in attitude can lead to resistance amongst employees from accepting new ideas, or even can be a cause for the failure of the OI strategy and business continuity (Lucas and Goh, 2009).

In the literature review carried out by Antons and Piller, (2015), the researchers were able to demonstrate the vast usage of the term versus the studies that actually focus on NIHS. Most of the studies mentioned in this review superficially use NIHS as a support for their hypotheses or to justify the outcomes of their studies (see. Laursen and Salter, 2006; Bradonjic, Franke and Lüthje, 2019). Despite the frequent use of NIHS in the context of innovation, strategy, human resource and marketing, the phenomenon remains under investigated in terms of its antecedents, its repercussions and mostly significantly its countermeasures (Antons *et al.*, 2017). Some of very recent papers call for more work to be carried on exploring ways to facilitate the OI process and minimize the NIHS (Markovic *et al.*, 2020; Obradović, Vlačić and Dabić, 2021).

Given the significance and lack of research on; 1) how NIHS actually impacts firms ability to integrate partner knowledge leading to reduced innovation performance and 2) how NIHS can be contained (Antons and Piller, 2015; Hannen *et al.*, 2019; Markovic *et al.*, 2020; Dahlander et al., 2021), this paper aims to advance and develop the understanding of NIHS in an OI collaborative context paying special attention on the factors that can attenuate the impact of NIHS and enhance the overall ability of firm to absorb external ideas.

Innovation carried under OI strategy is a resultant of firm's interaction with the external actors, which largely consists of social interaction between individuals from both firms for exchange of the knowledge (Laursen et al., 2012). Having a strong social relation with these external partners then becomes basis of trust and cooperation for acceptance of new ideas (Nahapiet and Ghoshal, 1998), since mistrust is amongst the triggers that prevent integration of external knowledge into use, by creating resistance amongst individuals (Grosse Kathoefer and Leker, 2012). Similarly, reciprocity is considered as a key aspect of the social capital, which provides sense of mutual indebtedness and expectation of reliance that eventually leads to positivity in attitude towards knowledge sharing (Lin, 2007; Steinmo and Rasmussen, 2018). Having any kind of resistance towards external collaborating partners implies weakened relationship/external social capital and eventually difficulty in absorbing foreign ideas for carrying out innovation.

While a limited number of studies include cursory discussion on NIHS and its consequence, investigation for measures that can contain NIHS largely remains outstanding (Markovic et al.,

2020). Some of the insights presented in literature include; suggestion for making individuals part of decision making and continual reconstruction of working group which will broadens their scope and create acceptance for outside ideas amongst the individuals (Katz and Allen, 1982). Similarly, through shuffling the individuals across different projects, the firms are able to influence the NIHS (Grosse Kathoefer and Leker, 2012). Likewise, introduction of fair incentives, placement of coordination systems, and provision of sufficient information to the users can reduce the fear and increase commitment towards adoption of open system (Keinz et al., 2012; Saebi and Foss, 2015). Another successful means for reducing the rigidity towards external ideas is through enhancing employee competence, i.e. by providing professional training which increases their self-confidence and reduces the fear towards the openness of knowledge boundaries (Burcharth et al., 2014).

In one of the most recent studies carried out in this regard suggests perspective taking as a successful countermeasure for NIHS (Hannen et al., 2019). In the same study, the researchers points towards innovation climate as being one of the countermeasure for NIHS. The basis for this argument are present in the literature, for example Shanker *et al.*, (2017) demonstrated in their study, the positive impact of innovation climate on not only the innovation performance, but also the attitudes of individuals. Since NIHS is an attitudinal bias, one can argue that NIHS can also be corrected through work climate, strengthening the claim of Hannen *et al.*, (2019). However, the discussion over innovation climate in this study is very limited and this argument is constructed over responses that were collected through interviews. Having to confirm this argument and respond to the call for extension of this work by researchers, we intend to supplement this study by quantitatively testing and verifying the relationship between innovation climate and NIHS.

The current study contributes to the need of quantitative studies on NIHS by testing the impact of NIHS on innovation achieved through collaboration. Most importantly, it unveils how impact of NIHS is mediated through external social capital, rather than directly impacting innovation performance achieved through collaboration. Further, it demonstrates innovation climate as being a successful way to contain the negative effect of NIHS. The work is carried out using quantitative survey data collected from 250 firms across France, Italy, Spain and Sweden.

2. Literature review and Hypothesis building

2.1. Not Invented Here Syndrome

The abundant referral of NIHS throughout studies reflects the importance of this phenomenon (Antons and Piller, 2015). The Kodak case is an exemplary exhibition of what could occur as result of employee rigidity and resistance towards learning of new ideas and technology (Lucas and Goh, 2009). Not only this resistance could jeopardize growth of a firm, but it also possesses enough potential to threaten its continuity.

NIHS is seen as an attitude induced bias towards knowledge that originates outside the boundaries of a group or a firm. The syndrome is not inherent in a person, rather it is developed over time (Clagett, 1967). Literature highlight various antecedents responsible for development of this bias, however mainly it is driven by need to maintain self-esteem, to have an affirmation of own value and or even to maintain social identity (Ajzen, 2001; Eagly & Chaiken, 1993).

Human beings constantly seek security, and they tend to feel threatened by any uncertainties which could also be in form of new external ideas and technology. By opposing this knowledge, they strive to maintain their status in firm and counter the threat of insecurity (Burcharth, Knudsen and Søndergaard, 2014). The rejection of the idea here is not based on its content, rather it is influenced by individuals' attempt to solidify their contribution and commitment to the firm, with more weight given to ideas and views of their own or which are collected within the organization and reducing reliance on the external sources (Katz and Allen, 1982; Grosse Kathoefer and Leker, 2012).

Similarly, accepting the external ideas and making them part of a project could shatter the research group's esteem, leaving them with a feeling that the external ideas are regarded as superior to their own (Grosse Kathoefer and Leker, 2012). In an attempt to protect their prestige, prejudices may emerge against the externally generated ideas, resulting in more reliance being placed on new in-house knowledge rather than having to use knowledge created elsewhere. This becomes particularly relevant in cases where firms have internal R&D department which is perceived to be highly capable within the firm. In an attempt to therefore protect the imagine, or sometimes deeply believing that their internal ideas are far superior than externally generated ones, individuals may outright reject the idea of OI (Lichtenthaler and Ernst, 2006).

This challenge is inflated for firms whose R&D department is also responsible for integration of novel external ideas (Grant and Baden-fuller, 2004), creating difficulty from initiation up to the continuity of firm's effort to adapt OI practice. This is because implementation of OI as a strategy require individuals to scout and filter ideas, before they are adopted for use (Rangus and Slavec, 2017). OI is not just a technological phenomenon which could be bought and made part of business, instead it uses multiple organizational factors for evaluation and internalization of ideas that exist outside the boundaries of the firm (Chesbrough, 2007; van de Vrande *et al.*, 2009). In a case where the firm is even able to overcome the primary issue of idea evaluation through help of specialized consultants or a purposely hired R&D manager, the issue of its exploitation remains in entirety. For instance, literature documents cases where firms have dedicated R&D managers or have employed specialized intermediaries that seek novel ideas, yet they still struggle when it comes to their implementation (Sieg, Wallin and Von Krogh, 2010). This inability of the firm is again a resultant of 'lack of commitment' or resistance amongst the personnel who are responsible for implementation of novel ideas, driven by NIHS (Chesbrough and Crowther, 2006).

In addition to individuals' self-perception of foreign ideas, their behavior is also driven by need of conformation to a group. This need is based on emotions and values that the individual places on association with a group (Hogg and Terry, 2000). Despite being part of multiple groups at one

time, individuals tend to lean their association towards a particular group at any given time (Hogg, 2006). Having an elevated sense of identification with a firm or a group, individuals are more likely to sustain their engagement within its boundaries by limiting their reliance on external ideas (Langner and Seidel, 2015). Thus in process of shielding and maintaining their social identity, individuals might go as far as carrying out biased evaluation of ideas generated outside, eventually triggering rejection due to NIHS (Michailova and Husted, 2003).

However, identification and use of external ideas under collaborations in OI does not come without challenges (Bierly, Damanpour and Santoro, 2009). These obstacles could come in different ways, such as in a form of inappropriate incentives to catalyze and facilitate the adoption of ideas, or having to face transactional costs higher than the benefits reaped from implementation of ideas itself (Lee *et al.*, 2010; Manso, 2017). In this situation, dismissing or resisting the use of external ideas might actually be beneficial and may serve as a means of commitment by the firm to pursue development of technology in-house, thereby providing the researchers correct incentives (Rotemberg and Saloner, 1994).

2.2. NIHS and Innovation performance achieved through collaborative project.

Innovation is based on newness of product, process or firm's entrance into new market as an outcome of projects carried out through collaboration. In order to achieve these results, firm engages multiple partners as each partner carries a different perspective and can be a channel to access asymmetric resource and capabilities. Novel outcomes are largely driven by technological advancements, and to keep up with these rapid changes, a firm simultaneously needs diverse set of skills and knowledge to keep up with the innovation process, which are difficult for a single firm to maintain (Gautam, 2000).

There is consensus in literature regarding the positive impact of collaboration on the firm's ability to achieve innovation goals in terms of novelty (Enkel, Gassmann and Chesbrough, 2009). As demonstrated by Haus-Reve et al., (2019) the benefits of collaboration with scientific partners and suppliers for product innovation, since collaboration with suppliers gives access to tailor made efficient solutions for the market. Similarly, process innovation, which is seen as a support for the product innovation is positively impacted when a firm collaborates with suppliers amongst other partners (Un and Asakawa, 2015). Broadly, this positive impact can be associated to advices that the supplier can provide with regards to the manufacturing process, leading to improvement in efficiency and manufacturability. And having benefit of working with multiple clients, the suppliers can act as a source of information regarding the best practices existing in the industry (Ettlie and Reza, 1992). Benefits from collaboration are not limited to exploration and exploitation, coupling with external partners can also provide the firm with opportunities to access new markets. Collaboration can lead to reduced risks in terms of entering into novel technical markets and also facilitate by providing the learning needed to explore novel market (Tsouri, Hanson and Normann, 2021).

Firms looking to collaborate aim to benefit in distinct manners, first are those that are aiming to acquire knowledge which is not available within their boundaries (Chesbrough, 2003). This could be in form of technical knowledge, market needs or customer demands (Belderbos, Martin and Lokshin, 2004). Collaboration thus becomes a channel for acquisition of new knowledge, which is principal for carrying out innovation. Second is the access to partner's resources (Gautam, 2000), allowing the firm to pool its resources with their partners in order to achieve projects which otherwise would be difficult to accomplish (Hagedoorn, Link and Vonortas, 2000).

However, it is important to note that significant portion of firm's ability to make use of this external knowledge is largely dependent upon the individuals working in the firm (Cohen and Levinthal, 1990; Leal-rodríguez et al., 2014).

Any resistance amongst individuals towards acceptance of external ideas can therefore diminish firm's ability to absorb and utilize knowledge, and subsequently damage or hinder achievement of performance through collaboration. Since collaboration is a social process and requires individual level relationship at various hierarchical levels for exchange of ideas. As Eisenhardt *et al.*, (1996) mentions how sometimes the entire relationship between two firms is largely staged on few key individuals, hence outlining the significant role of individuals in alliance aimed at exchange of tacit knowledge.

NIHS by nature restricts individual's perception and creates disposition towards acceptance or use of external knowledge based on a biased criterion (Burcharth, Knudsen and Søndergaard, 2014). This implies individuals not just voluntarily will ignore the external knowledge, their ability to objectively identify and assimilate ideas might get enduringly restricted, leading to a reduced firm level capability to scout and implement external ideas and knowledge (Cialdini, Petty and Cacioppo, 1981; Szulanski, 1996).

Similarly, negative attitudes not only impact the individuals' attention towards ideas from a certain source, but can influence their capacity of judgement and memory (Bohner and Wänke, 2002). NIHS therefore is not just a bias that predominantly limits the selection process of knowledge, but can eventually lead to reduction in firm's actual capacity to interpret and utilize external ideas, making it difficult for firm to benefit from collaboration that was aimed at innovation.

Drawing on the discussion, we argue that any resistance by individual against acceptance and implementation of external ideas can limit the innovation achieved through projects carried out in collaboration with external partners:

H1: NIHS negatively impacts the innovation performance of collaborative project.

2.3. The role of external social capital in the relation between NIHS and innovation performance

As discussed earlier, novel innovation performance strongly depends on mix of internal and external ideas (Laursen and Salter, 2006), and merely having collaborating partners is not a guarantee for a project to be able to receive new ideas for carrying out novel innovation. External linkages can amplify number of ideas and hence the innovation performance, however these outcomes are significantly influenced by the social context in which the collaboration exists. As demonstrated in various studies, social capital can significantly influence the efficiency of the knowledge exchange (Gulati, Nohria, & Zaheer, 2000) and subsequently the innovation achieved through collaboration.

From a receiver's end, social capital is said to impact organizational ability of acquiring and transmitting the external knowledge, inside its boundaries (Adler & Kwon, 2002). Social capital is formally defined as "sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through the network." (Nahapiet and Ghoshal, 1998, p.243). Social capital facilitates innovation through enabling people to combine and channel their knowledge across different organizations. This is done through providing them with a language that favors efficient communication allowing for exchange of deeper or tacit knowledge (Kogut and Zander, 1996).

Social capital consists of three dimensions (Nahapiet and Goshal, 1998) which distinctly reinforce the process of knowledge exchange. The structural aspect of social capital constitutes of the relationship pattern between different actors, although indirectly, structural dimension strongly

impacts social interaction and consequently the knowledge exchange. It also dictates the way in which the actors are related, the channel of communication and the ease or difficulty of knowledge exchange which ultimately impact the cost and the frequency of communication between partners. Further, it helps in identifying partners abilities in term of the resources and knowledge they could offer, making it easier to identify and access the certain type of knowledge needed to carry out their project (Lin, 2001, Uzzi, 1996).

The cognitive dimension can broadly be understood as shared understanding, commonality of language or similarity of goals. However, the fundamentals strengthening this dimension of social capital are shared goal and shared culture (Adler and Kwon, 2002). Shared goals refer to congruent way of target identification, its interpretation and orientation of actions to achieve it. In terms of collaboration carried out for innovation, the common aim is focused on novel idea generation, hence the similarity of goal makes it easier to for partners to share knowledge to achieve the outcome. Shared culture on the other hand refer to the norms and rules that govern the behavior of partners in a collaborative setting. As much as shared norms may support the knowledge exchange by setting certain expectations from each partner, it can at same time give rise to free riding problem i.e. by having excessive expectations from one party (Inkpen and Tsang, 2005).

The third dimension of social capital focuses on the relational aspect and characterizes how the exchange of assets or knowledge takes place as an outcome of the relational quality (Nahapiet and Ghoshal, 1998). A dense relationship is based mutual respect, trust, and how much interdependence and reliance partners place on each other (Adler and Kwon, 2002). Relational social capital is argued to ease knowledge transfer by creating an environment of trust amongst the participants increasing the willing of each partner to exchange knowledge and thereby reducing the partner differences and the probability of having any negative effects as outcome (Reagans and Mcevily, 2018; Lavie et al., 2012). Also the transaction cost as a result of trusted collaboration is lower than the situation where firms must set up controls to deter any risk (Adler and Kwon, 2002). An important aspect of collaboration for knowledge is the tacit part of knowledge, which has somewhat personal traits and becomes challenging for firms to formalize and share (Nonaka, 1994). Relational aspect comes over this challenge by stimulating a trust worthy and personal level connection, allowing partners to exchange knowledge at individual level which otherwise would be difficult to share. Similarly, long lasting and repeated relationship are often related to the relational aspect of social capital, as strong ties lead to trust and encourages partners to make higher commitments and have repeated relationship (Capaldo, 2007).

The combined effect of the three dimensions is positive on joint innovation project performance, i.e. by providing a knowledge conducive environment to exchange novel ideas. The shared language, norms and goals encourages individuals to share intellectual ideas in least formalized manner leading to low dissemination cost of knowledge and increased intellectual capacity of firm (Nahapiet and Ghoshal, 1998). However, these same relationships can sometimes turn into obstacles, as a firm might start placing too much of reliance on certain partners limiting the idea sources and subsequently the creativity (Capaldo, 2007). Collinson and Wilson (2006) argue that too much preference and reliance on certain partners can also lead to limited strategic flexibility, hence having strong social capital is not a guarantee of success. Similarly, social capital requires effort in form of communication, continuous coordination and involvement of various elements from across project members to maintain social capital. However, these can at same time become a burden and lead to higher costs and could also reduce rate of innovation.

While collaborative projects benefit from social capital as it facilitates the movement of novel ideas from partners, the transaction still stay largely dependent upon individuals who carry most

of the codifiable tacit knowledge (Nelson and Winter, 1982). This highlights the importance of individuals in the social setting where a project's novel performance could easily be influenced by the pre-disposition they might hold. The significance of individuals also lies in the necessary preconditions for knowledge exchange, since shared vision and values among the collaborating team members forms basis for knowledge exchange and hence the knowledge amalgamation needed for novel innovation (Li, 2005). Moreover, when it comes to sourcing of technical ideas from outside the boundaries, studies have demonstrated that personal level contacts and communication are significantly important (Allen, 1977) and are vital for carry out collaborative innovation.

Amongst the components of external social capital, relational dimension is driven by mutual respect, reciprocity and closeness (Adler and Kwon, 2002). These attributes are built collectively through individual interaction which ultimately favor the results from collaborative projects. Any component of distrust or biasness in attitude towards collaboration would imply that the interaction would not be repeated in future; hence leading to failing of the relational aspect of external social capital. As Lindegaard and Kawasaki (2010) highlights NIHS as one of the major barrier in face of building trust based relationship with the external partners for novel ideas. Further, 'mutuality' and 'joint' resource exchange which form the basis of relational dimension (Nahapiet and Ghoshal 1998), can diminish as one party in the joint knowledge creation project decides not to take in foreign ideas (NIHS).

Similarly, goal incongruence and divergent interests can shake up the cognitive dimension of social capital. As the teams involved in project innovation have different goals, i.e. one is aiming for joint collaboration and the other is trying to produce something based on in-house and own ideas (NIHS). This may lead to rejection of most of ideas present by foreign partners leading to frustration (Steinmo and Rasmussen, 2018). Further, long lasting external social relation is resultant of repeated and trusted interactions (Pérez-Luño *et al.*, 2011), in presence of a resistance by one side of team members will eventually lead to elimination of trust, or the foreign partners whose ideas are never accepted may decide of not repeating this relationship.

In light of the developed arguments, we conclude that external social capital enhances firm's ability to take in novel ideas from its collaborating partners, hence increasing the project innovation performance. Whereas the impact of NIHS on external social capital is negative, since it hinders the flow and exchange of knowledge between project members. Therefore, instead of having direct relationship with the innovation performance, the effect of negative attitude (NIHS) is mediated through external social capital, i.e. by hindering the flow of knowledge exchange. Hence we hypothesize:

H2: Impact of NIHS on collaborative project performance is mediated through external social capital.

2.4. Innovation climate and NIHS

The concept of climate can be traced back to social psychology as the phenomenon explains how individuals, their motivation and behavior can be influenced by work environment. Climate can be described as prevailing quality of firm's internal environment, that is largely a resultant of policies and behaviour of the managers (Abbey and Dickson, 1983). In a review carried out by Schneider et al., (2017), the researchers discuss various studies that investigate use of various measures implemented by managers to invoke a different climate, aimed at contrasting outcomes. For example, Abbey and Dickson, (1983) examines how internal climate influences work behavior of R&D team in terms of their attitude and performance. Another study carried out by (Gonzalez-

Roma, et al., 2009) emphasizes the relevance of climate for its impact on team and financial performance.

More recently, studies have revealed the importance of climate in upraising innovative behavior, through extending autonomy, freedom and making the specialised knowledge available (Shanker et al., 2017). A possible explanation for this relationship lies in the fact that innovation involves application of novel ideas to realize improved products or work methods, hence providing the teams such a climate would allow them to be confident in using their ideas (Gonzalez-Roma, et al., 2009). Similarly, firms that rely on open innovation and make use of external ideas can also make use of innovation climate to enhance their innovation performance. Given the internal routines are aimed at favoring knowledge sharing, providing autonomy to employees or allowing them to develop continually, these eventually allow firms to successfully collaborate with external partners and implement ideas gained in the process (Lewin, et al., 2011).

Individuals driven by the idea of resisting external knowledge even if it is potentially beneficial for the organization (NIHS) can be a challenge for the organization. However, certain internal activities can eventually create such an internal context which can facilitate integration of external ideas (Burcharth et al., 2013). The researchers further deliberate that autonomy and freedom to take timely decision is important for individuals to be able to use external ideas, as continuous consultation/too much intervention from the upper-echelon managers for each decision is cited as a reason for rejection of the external ideas by the individuals (Katz and Allen, 1982; Burcharth at el., 2013). Too much intervention leads to outright rejection of ideas by the individuals, since the time and effort involved in using an external idea is too high.

Similarly, having an internal climate that is positively perceived by the individuals is most likely to enhance their motivation and commitment towards the firm's goals (Shanker *et al.*, 2017), and could possibly encourage them to pretermit their self-created biases (NIHS) and engage with external partners for benefit of the firm i.e. innovation. On further examination of literature, we find an argument presented by Fainshmidt and Frazier, (2017) stating that the right type of internal climate can even influence attitude of individuals. This further strengthens the proposition that innovation climate has some relevance in de-biasing the NIHS as it ultimately is an attitudinal bias.

Moreover, social theorists also suggest that individuals base their decisions and attitudes on social cues they perceive from their environment (Fainshmidt and Frazier, 2017). Before having to act, individuals receive information from around and mold their attitudes accordingly (Cameron and Webster, 2011). In the same sense, if individuals are working in a climate where idea sharing is encouraged, and they are used to internally communicate and collaborate, they are more likely to be open towards external ideas they receive for innovation (Lewin, Massini and Peeters, 2011).

Considering that innovation climate consists of an environment that encourages individuals to experiment their ideas, and provides them with appropriate recognition (Diesel and Scheepers, 2019), it is plausible that this climate can reduce their fear of being seen as incompetent. This fear is sighted as another reason why individuals become resistant towards accepting external ideas (Antons and Piller, 2015). Further, Innovation climate is not limited to promoting openness, positive attitude and acceptance towards new ideas, it is also capable of changing cognition of an individual (Hannen *et al.*, 2019). This signifies that the individuals will have positive impact on their ability to process external knowledge and reduce the fear of unknown against the external knowledge.

In the light of the given propositions, we argue that innovation climate is a possible counter measures to NIHS:

H3: Innovation climate negatively impacts the NIHS

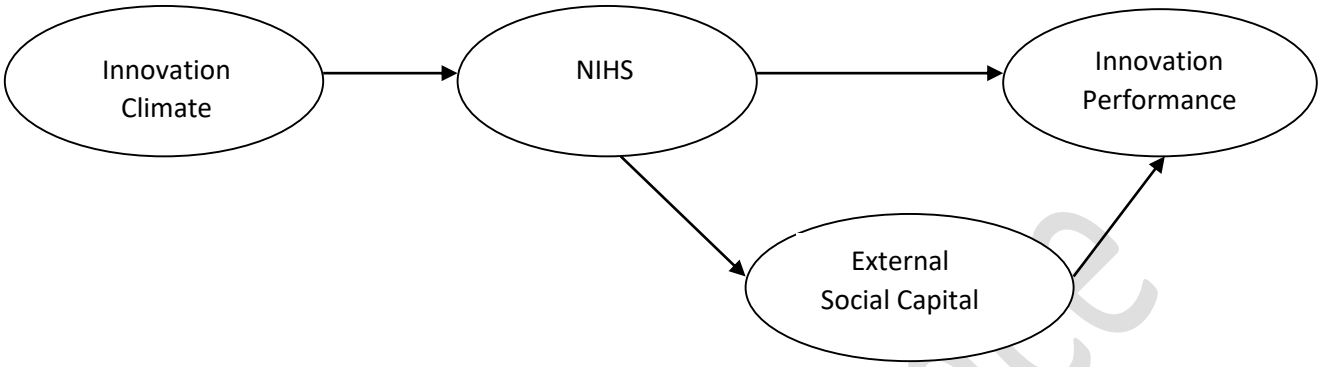

Figure 1: Research Model

3. Methodology

3.1. Data and Sample

The data has been collected through an international survey on open Innovation collected during 2018. The objective of this survey was to gather data in the manufacturing industry regarding the 'open innovation (OI) choices', the 'drivers' of such choices and the consequent 'performance', being the 'collaboration framework'. Advantage of a specialized survey is to overcome two broad limitations present in the literature. The first is the use of a proxy for measuring different measure related with open innovation, and the second is the limitation associated with large data sets. Databases such as the Community Innovation Survey (CIS) are constrained with respect to the depth of questions, and often in terms of the construction of measures.

The firms targeted for response belong to high, medium and low technology manufacturing firms. The data was collected through means of a survey sent through emails that were addressed to CEOs, R&D or technology managers, or those aware of the firm's innovation decisions. The final number of completed response collected was 334 out of which 84 had missing data that was more than 15% of the total questions, therefore these were dropped. The final sample of 250 comes from four countries: 30 from France, 113 from Italy, 41 from Spain and 66 from Sweden (see table 1). Table 2 shows the size wise distribution of firms based on the total number of employees working for them, as we can observe most of the data pertains to the firms that fall in large category having more than 250 employees

Table 1. Distribution of the firms used in the final analysis with respect to country and technology

	High Tech	Medium Tech	Low Tech	Total
Italy	0	13	100	113
France	7	22	1	30
Spain	1	28	12	41
Sweden	7	44	15	66
Total	**15**	**107**	**128**	**250**

Table 2: Distribution of the firms used in the final analysis with respect to firm size

Firm Size	Frequency	Percentage
Small firms <50 employees	79	31%
Medium firms 50 to 250 employees	59	24%
Large firms >250 employees	112	45%
Total	**250**	**100%**

3.2. Measures and Variables

Until stated otherwise, all the constructs are developed using 7-point Likert scale based on responses ranging from 'strongly disagree' to 'strongly agree'. Appendix 1 lays each specific item used for construction of variables, along with corresponding values of their factor loadings, Average Variance Extracted, Composite Reliability and Cronbach's Alpha.

Innovation performance is regarded as introduction of new or significantly improved product or entrance into new markets (Alegre et al., 2006). To capture this definition, we applied a six-item scale based on the previous work carried out by (Lazzarotti et al., 2011) and subsequently enhanced/split items to fully capture the definition of novel project performance. The questions were focused on capturing actual performance of the project against what was objectified for entering into collaboration with external partners.

External social capital is based on the concept elaborated by Nahapiet and Ghoshal, (1998) and Inkpen and Tsang, (2005), which consists of the three dimensions of social capital. To measure the strength of relationship with project collaborating partners, we adopted items similar to the study carried out by (Lazzarotti et al., 2016), with an attention on each dimension of social capital (Relational, Cognitive and Structural). The five questions used in our survey captured the overall firm level experience with respect to the project that was carried out in collaboration with external partners.

Innovation climate is defined as environment that is based on strong environment that encourages exchange of knowledge, and where individuals are provided autonomy and freedom to use their ideas (Shanker *et al.*, 2017). The five items used for constructing the variable are based on the items that were used in the study carried out by (Scheepers and Storm, 2019) and further enhanced to cover the definition.

Not invented here syndrome is defined as the attitudinal bias of employees towards external ideas and the impact was captured through questions that are focused on average attitude of employees. For this aim, the questionnaire specified managers to keep focus on the general difficulties they face while deciding to collaborate for innovation, since they are most knowledgeable with respect to the difficulties they directly or indirectly face while opting for a collaboration decision. Different ways have been adopted in literature to assess attitude, i.e. through both direct and indirect measures (Bohner and Wänke, 2002). Direct being simply asking the employees questions directly and assessing their behavior, however since the aim of our study is to gauge the general bias amongst employees, we adopted the indirect method and the scale was based on the previous studies carried out by (Burcharth et al., 2014). The scale was rephrased to capture both the aspects of NIHS; namely acceptance of ideas and its implementation (Lichtenthaler and Ernst, 2006).

Size of the firm has significant influence on innovative capabilities and innovation performance (Cassiman & Veugelers, 2006), by allowing the large firms to exploit economies of

scale, that may possess heterogeneous groups of skilled workers. Therefore, firm size was controlled for its impact by dividing the firms as per the total number of employees working for them; firms having less than 50 employees were categorized as small, firms having employees between 50 and 250 were characterized as medium and firms having more than 250 employees became large. Small firms were taken as base for analysis.

Similarly, firm's internal R&D capability also can have a significant influence on firm's ability to absorb external ideas (absorptive capacity), which in return can impact the innovation performance (Zahra & George, 2002). Thereby, R&D intensity is controlled for since it can directly impact the innovation performance of the firm (Kobarg et al., 2019). R&D intensity is calculated as natural log of the percentage of R&D expense over the sales.

Further, firms' innovative behavior can also be affiliated with the industry they operate in (Martinez et al., 2017); hence, we controlled for industry effect by following the OECD classification, which distinguishes industries with respect to technology intensity and knowledge intensity (OECD, 2005). The result was three dummy variables representing firms – 1) high-technology firms, 2) medium-technology firms and 3) low-technology firms. For the purpose of analysis, low tech firms were taken as base.

Finally, the country wide difference is controlled, since each country is inclined towards having varied R&D expenditure and this may expose firms to opposing knowledge environment (Sofka and Grimpe, 2010). To incorporate the impact of each country, we introduced a dummy variable for each of the four countries (France, Italy, Spain and Sweden). Spain was taken as base in the final analysis.

4. Estimation and Results

4.1. Reliability and Validity

Table 3 contains the correlation matrix amongst all variables, NIHS is negatively related with external social capital, project performance and internal climate, as a perceived in the hypothesis. Whereas the strength for all the values for correlation between variables are lower than the unsafe limit value of 0.75 (Tsui et al., 1995).

Table 3. Correlation between variables and their respective significance levels.

	Mean	StD	1	2	3	4	5
1. R&D expenditure	10.9%	11.4%	1				
2. Not Invented Here Syndrome	2.85	1.67	-0.002	1			
3. Novel Project Success	5.36	1.43	0.370***	-0.123*	1		
4. Innovation Climate	5.20	1.38	0.488***	-0.210***	0.679***	1	
5. External Social Capital	5.34	1.25	0.285***	-0.201***	0.586***	0.631***	1

*Significant at 0.1, ** Significant at 0.05, ***Significant at 0.01.

The initial factor development is based on principle component method, descriptive analysis and OLS models are all carried through STATA 16.0. Before carrying out the analysis, several robustness tests were employed to assess the reliability and validity of variables. As an initial step, the variables were based on established items used in prior literature. Further, the item loadings for all the variables are greater than 0.6 confirming the content validity requirements (Nunnally, 1978). Similarly, we checked values of composite reliability (should be ≥ 0.7) and Cronbach's α value, all of which were above 0.8. Additionally, to measure the convergent validity of the items, we examined the Average Variance Extracted all of which were greater than 0.5 (Fornell and Larcker, 1981) see Appendix 1. Subsequently, we ran exploratory factor analysis with varimax rotation, by loading all final items together, and this gave us clearly four factors how they theoretically were supposed to be. Also the Kaiser-Mayer-Olkin (KMO) test (value=0.90) and Bartlett's test of sphericity ($\chi 2=3127.186$; df=153, $p < .01$) indicate adequacy of these items and factors.

After confirming validity of the variables and the items representing them, we also carried out Harman's one-factor analysis test to examine existence of any common method variance since the data for all measures comes from one source (Podsakoff and W.Organ, 1986). In a four factor analysis, the explained variance from all the items loaded together was around 41% which is substantially lower than 50% implying the risk of self-report bias was absent. As a robustness test we ran the final mode through Process macro SPSS (Hayes, 2012) to test the significance and beta value of external social capital's mediation between NIHS and project performance, which came out to be similar and significant, hence validating the model. Finally the values for $R^2$and $\text{adjusted} - R^2$ for all the models are closer to higher moderate side, implying satisfactory strength of the models (Chin, 1998; Henseler, et al., 2009).

4.2. Main results

The aim of the study was to assess the relationship of NIHS with the novel project performance, with external social capital as being a possible mediator. And further, to test

innovation climate as a possible countermeasure for NIHS. The estimations from the regression model are presented in Table 4, with novel project performance, External Social Capital and Not Invented Here Syndrome set as dependent variables across different models.

The first hypothesis was aimed at investigating the relationship between NIHS and novel project performance. The β value for this relationship came out to be negative -0.139 and significant at P<0.05 (model I), confirming our hypothesis and implying that attitudinal bias amongst individuals towards acceptance of foreign ideas that could be useful for firm's innovation leads to reduced novel project performance.

The second hypothesis stated that external social capital acts a mediator between NIHS and novel project performance. As a first step to verify this claim, the relationship between NIHS and external social capital was tested presented in form of model III. The value for β came out to be -0.191 and highly significant at P<0.01, confirming the relationship between NIHS and external social capital. As for the second step, we use the result from first hypothesis (model I) to verify the existence of relationship between NIHS and novel project performance. As a final step we introduced external social capital in the relationship between NIHS and novel project performance in form of model II. The β value for NIHS now becomes insignificant, whereas the β value for external social capital is strong at 0.440 and highly significant at P<0.01 confirming the mediation of external social capital between NIHS and novel project performance (Aguinis et al., 2017). Further, to strengthen the analysis, the same model was run through Process macro in SPSS (Hayes, 2012), the final indirect impact of NIHS on novel project performance through external social capital came out to be β= -0.089 with confidence interval between -0.1585 and -0.0377 validating our results. This implies that instead of NIHS syndrome having an impact on novel innovation performance, it causes the relationship with external partners to weaken, ultimately leading to reduction in inflow of knowledge and ultimately causing negative impact on novel innovation. The results are comparable and complement the study carried out by Hannen *et al.*, (2019), who found out that the impact of NIHS on innovation is mediated through knowledge absorption.

Finally, we investigate possible countermeasure for NIHS in form of the negative impact of innovation climate on NIHS. The results are laid in model IV, the β value came out to strong and highly significant with a value of -0.387 at P<0.01. This confirms our arguments that providing a climate that encourages and empowers individuals to be creative, test and share their ideas internally leads to reduction of the resistance they hold towards foreign ideas.

Table4. Results of the regression models

Dependent Variable	**Novel Project Performance**		**External Social Capital**	**Not Invented Here**
	I	**II**	**III**	**IV**
Controls				
Constant	-0.361* (0.203)	-0.193 (0.184)	-0.343 (0.209)	-0.554** (0.224)
R&D percentage	0.090 (0.071)	0.079 (0.064)	0.026 (0.074)	-0.005 (0.079)
Firm Size		*Included*		
Country indicators		*Included*		
Industry indicators		*Included*		
Independent Variables				
Not Invented Here Syndrome	-0.139** (0.056)	-0.054 (0.050)	-0.191*** (0.058)	
External Social Capital		0.440*** (0.056)		
Innovation Climate				-0.387*** (0.082)
R^2	0.305	0.441	0.259	0.191
Adjusted -R^2	0.279	0.418	0.231	0.160
Number of observations	250	250	250	250
Prob > F	***	***	***	***

*Significant at 0.1, ** Significant at 0.05, ***Significant at 0.01, Standard Errors in parenthesis ()

5. Discussion & Conclusion

While the organizational issues such as structural rigidities and resource constraint amongst various other reasons may reduce the success of external knowledge exploration and subsequently OI strategy (Garriga, Krogh and Spaeth, 2013). Such mentions however, only partially explain why some firms are unable to internalize ideas that are generated outside its boundaries. It is important to recognize the role of individual in enabling an organization to benefit from open innovation and internalize the idea from its environment. This study has been carried out as a response to the recent calls for further investigation on individuals and their biases (namely NIHS) that can prevent or hamper a firm's ability to adopt ideas and use them for novel innovation performance. Despite having widespread use of NIHS as a term, either to reinforce hypotheses or to explain an outcome, studies dedicated on the subject are limited (Antons and Piller, 2015).

One way to approach NIHS is by investigating countermeasures which have already not been established in the literature, however, we find it important to understand the relationship between NIHS itself and Innovation performance, before approaching it. Outcome of this technique is clarity in literature, a way forward for researchers and at same time, providing practitioners a tangible solution to an important issue.

This work is based on a detailed discussion of NIHS including the reasons which derive it and subsequently its impact on firm's ability to externally interact and bring in ideas for innovation. Departing from the widespread understanding found in literature regarding NIHS having an immediate impact on the novel innovation performance, this study reveals that the NIHS does not directly influence novel innovation performance, instead it weakens the social relationship with external partners, leading to reduction in availability of ideas that are normally acquired from partners for innovation. Our results are in line with the study recently carried out by Hannen *et al.*, (2019), who demonstrated how impact of NIHS on project performance is mediated through knowledge absorptive capacity, impeding the organizational learning capability.

It is well recognized in the literature that a firm's ability to innovate can be impacted by its external partners (Man and Duysters, 2005), as the firm is able to access various more ideas than what it holds. However, the flow of knowledge does not take place just by virtue of collaboration, the quality of relationship has an important part to play. The aspect of trust and goal congruence helps in connecting people across partner firms, allowing them to exchange and combine knowledge. The resistance of individuals to accept external ideas diminishes the quality of this relational channel, restricting firm to innovate based mostly on internal knowledge. The limitation in inventory of ideas then subsequently leads to reduction in success of innovation output. Thus the focus of concern for managers must be on how to strengthen the external relational quality and contain NIHS, which eventually will improve innovation performance.

At theoretical level these findings carry substantial importance, since they steer the future researchers approach towards investigation of NIHS and its countermeasures. This deviation in perspective takes place once we recognize that impact of NIHS on novel innovation is indirect, and rather than looking for ways to improve innovation performance directly, researchers must investigate methods to strengthen firm's learning capacity (Hannen *et al.*, 2019) and interactional ability with partners.

As much as for researchers, this finding is significant for practitioners, since the understanding of cause and effect is elementary for testing various managerial tools to contain NIHS. Further, as demonstrated through various notable examples as how individual resistance can be a cause for

a bigger problem. Several studies pen examples on how companies were led to failure based on the individual's rejection of new ideas, be it a timely process level change or acceptance of new innovation or technology (Wells, 2000; Lucas and Goh, 2009). These eventually became root cause for failure of highest performing organizations, which were perceived to be market leaders otherwise. For this reason, attitudinal bias, especially towards innovation of product or services for fulfilling the changing needs of customers is seen as a threat by the practitioners.

To deal with this point of concern, as how to contain the individual resistance towards externally produced ideas, the second contribution of this study is based on investigation of a managerial tool that can contain NIHS and induce acceptance of external ideas amongst individuals. Climate refers to work environment characteristics, which directly or indirectly contribute to employee's motivation and work behavior. Hence an internal climate based on encouragement to learn and cooperate induces trust and openness towards collaboration with internal partners initially and subsequently the external partners. Some researchers also warn that solely focusing on innovation policies without providing the appropriate enabling environment may lead to unwanted results (Diesel and Scheepers, 2019). Hence, our findings strengthen these notions by empirically testing and confirming this idea. Further, as simple as it may see, innovation climate is an important tool for molding individual behavior. This finding is very much relevant and useful for practitioners who can prevent larger failure by employing and creating an enabling environment. Although the impact of innovation climate on NIHS was pointed out in earlier study (Hannen *et al.*, 2019), however this suggestion was solely based on interview data. And the same study calls for validation of this relationship through an extensive study.

One of the prominent merits of this study is the geographical diversity of data. Further this merit combined with the fact that this is survey was designed after in-depth review of literature and gaps, it over comes the limitation present in large scale data bases (like CIS), which do not contain such in-depth questions. However, our study has number of limitations as well, which may as well be an opportunity for future work. From methodological point of view, the responses were gathered from same source which could lead to a possible bias. However, we checked the possibility of having common method bias and were satisfied as there are no serious concerns. Further, we measured project success through a relative scale, instead of a measure which was absolute. Although, the scale we used was based on established literature, we cannot exactly measure precise contribution of NIHS towards project delays or failures. Lastly, as we know through past studies, all partners are not alike, some partners have features different from the others. Thus a deeper understanding of the impact on NIHS on innovation with respect to different partner types could improve the future understanding of this phenomenon.

Appendix

	PCF	AVE	CR	CA
Innovation performance achieved through collaborative project : Project you selected has actually performed (1: strongly disagree, 7: strongly agree)		0.686	0.929	0.906
1. Develop new products /services	0.820			
2. Improve existing products/services	0.728			
3. Enter new markets	0.831			
4. Increase sales (in k€)	0.835			
5. Extend the product/service portfolio	0.879			
6. Offer wider product/service range	0.869			
Not Invented Here Syndrome – Individual Level (1: Not at all, 7: Extremely)		0.713	0.881	0.895
1. Reluctance of R&D staff to work with external partners	0.915			
2. Reluctance to accept technologies/knowledge generated outside the company	0.931			
3. Potential detrimental impact on internal R&D resources and competences	0.870			
Innovation Climate – Firm Level (1: Not at all, 7: very important)		0.739	0.934	0.910
1. We give our staff time and resources to generate new ideas	0.896			
2. We set our staff creative and challenging objectives	0.889			
3. We allocate resources for our staff continuous professional development	0.880			
4. Our staff easily adapt to new situations	0.826			
5. There is a high level of collaboration within functional areas to identify and resolve emerging issues in innovation activities	0.803			
External Social Capital - Firm Level (1: Not at all, 7: very important)		0.632	0.896	0.845
1. There is a high level of trust among partners	0.802			
2. We have access to our partners' knowledge resources	0.862			
3. The resources and capabilities of our partners complement our resources and capabilities	0.742			
4. We share a similar management style with our partners	0.778			
5. Our knowledge similar to our partners' knowledge	0.787			

PCF= Principal Component Factor, AVE= Average Variance Extracted, CR= Composite Reliability, CA= Cronbach Alpha

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