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More effective solutions? Senior managers and non-routine problem solving

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Abstract

Research Summary: Solving non-routine problems—problems for which current organizational, recurrent action patterns do not offer a predetermined, effective solution—can be an important source of value creation. When these problems occur in subsidiaries of multinational corporations, senior headquarters managers can potentially help solve them. However, whether their involvement is beneficial rests upon the assumptions that they know which knowledge is appropriate and that their involvement does not negatively influence the problem solving process. We challenge these assumptions and theorize that the involvement of senior headquarters managers is negatively related to solution effectiveness, unless senior subsidiary managers are also involved, and especially if problems have an external locus (i.e., primarily relate to the firm's products and services). Our robust results are consistent with our theory.

Managerial Summary: Companies are often faced with new problems, which represent an opportunity for organizational improvements. But how different types of senior managers influence problem solving effectiveness has remained unclear. Studying problems occurring in foreign subsidiaries of multinational

corporations, we find that the involvement of senior headquarters managers is negatively related to problem solving effectiveness. Two reasons explain this result: senior headquarters managers often lack necessary understanding of their subsidiaries' contexts; and their involvement diminishes active participation of subsidiary employees. The negative relationship is especially strong when problems relate to products and services (as opposed to internal processes). Furthermore, we find that senior subsidiary managers can mitigate the negative consequences related to senior headquarters managers' involvement.

KEYWORDS

headquarters-subsidiary relationships, multi-unit firms, non-routine problems, problem solving, senior managers

1 | INTRODUCTION

Solving problems effectively represents an important source of value creation for firms (Cyert & March, 1963; Foss, Frederiksen, & Rullani, 2016; Nickerson & Zenger, 2004). Especially *non-routine* problem-solving offers considerable opportunities to develop and renew organizational knowledge and capabilities. Non-routine problems are those where the current organizational, recurrent action patterns do not offer a predetermined, effective solution (Nelson & Winter, 1982; Simon, 1977). In this article, we focus on non-routine problems that occur in foreign subsidiaries of multinational corporations. When solved effectively, these problems can generate new routines used in other subsidiaries and improve the performance of the entire firm (Birkinshaw, Hood, & Jonsson, 1998; Tippmann, Sharkey Scott, & Mangematin, 2012).

Effectively addressing non-routine problems is demanding because of the uncertainty regarding which knowledge is needed, who possesses this knowledge, and who is motivated to share relevant knowledge (Baer, Dirks, & Nickerson, 2013; Galbraith, 1974; Tushman & Nadler, 1978). Thus, in addition to subsidiary employees, a wide range of individuals usually become involved in gathering, interpreting, and synthesizing knowledge that can be valuable at all stages of the problem solving (i.e., from problem formulation to solution development) (Baer et al., 2013). In fact, individuals are often involved in problem solving for a variety of reasons that go beyond formal organization design (Cohen, March, & Olsen, 1972; Glynn, Greve, & Rao, 2020).

In the context of non-routine problems occurring in subsidiaries of multinational corporations, senior headquarters managers can play an important role (Nell & Ambos, 2013). Senior headquarters managers can bring in information, a codified type of knowledge that can be easily transferred, as well as know-how, a tacit type of knowledge (Kogut & Zander, 1992). They can share know-how such as strategic and general oversight (Galbraith, 1974; Mintzberg, 1979). They can also share knowledge regarding financing, legitimacy, and other resources that may be required to address problems effectively (Belenzon, Hashai, & Patacconi, 2019; Parmigiani &

Holloway, 2011; Tippmann et al., 2012). These potential contributions of senior headquarters managers may explain their involvement as well as why headquarters can improve subsidiary performance (Adner & Helfat, 2003; Feldman, 2021).

However, the benefits from the involvement of senior headquarters managers rest upon the assumptions that they know which knowledge is appropriate, and that their involvement does not influence the problem solving process negatively. These assumptions, we contend, can be called into question, especially in contexts in which headquarters and subsidiaries operate in different environments, such as in multi-business and multinational firms (Kostova, 1999; Kostova & Roth, 2002). In these contexts, headquarters and subsidiaries have different requirements and constraints, making it less likely for senior headquarters managers to provide appropriate knowledge. Different requirements and constraints also make it particularly important that subsidiary employees with relevant knowledge about the context are actively engaged.

Prior work focused predominantly on intermediary outcomes such as problem formulation (Baer et al., 2013), project behaviors (Foss et al., 2016; Tippmann, Sharkey Scott, & Parker, 2017), and knowledge access (Parker, Tippmann, & Kratochvil, 2019), thus providing limited insights about the role of senior headquarters managers on final outcomes of problem solving. How headquarters contribute to their subsidiaries is an essential question of strategy (Rumelt, Schendel, & Teece, 1994), and it is important to understand how headquarters can help develop effective solutions to non-routine problems that may be faced by several subsidiaries. Therefore, we ask: "Under which circumstances does the involvement of senior headquarters managers in non-routine problem solving occurring in their subsidiaries enhance solution effectiveness?"

Our arguments draw on the knowledge perspective of problem solving (Foss et al., 2016; Nickerson, Yen, & Mahoney, 2012; Nickerson & Zenger, 2004). We predict that the involvement of senior headquarters managers will be negatively related to solution effectiveness, because they lack understanding of local requirements and constraints and because their involvement reduces the active participation of subsidiary employees. We discuss two contingencies that relate to *who* else is involved in the problem solving and *what* the problem is about (Baer et al., 2013; Galbraith, 1974; Tushman & Nadler, 1978). First, we consider the role of senior subsidiary managers (e.g., general subsidiary managers and their direct reports) because they are a crucial source of relevant context-sensitive knowledge and can guide senior headquarters managers (Berry, 2014; Martin, 2011) as well as champion ideas of subsidiary employees to headquarters (Burgelman, 1983; Joseph & Ocasio, 2012). Second, we analyze the moderating role of problem locus (Bertrand & Mol, 2013; Leiponen & Helfat, 2010). Problems with an external locus primarily relate to the firm's products and services (e.g., unmet customer demand, outdated offerings). Problems with an internal locus primarily relate to the processes through which the firm conducts its activities (e.g., error-prone or redundant processes). Problem locus determines the necessary knowledge, which senior headquarters managers are either more or less likely to possess. We hypothesize that the involvement of senior headquarters managers will be positively (negatively) related to solution effectiveness when problems have an internal (external) locus.

We collected data on 120 non-routine problem-solving projects that occurred in 60 foreign subsidiaries of 40 multinational corporations. We administered multiple surveys with different informants. We find that, on average, the involvement of senior headquarters managers is negatively related to solution effectiveness, unless senior subsidiary managers are involved. This negative effect is especially strong when problems have an external locus. Matching techniques and an instrument-free approach alleviate endogeneity concerns. Post hoc analyses are

consistent with our mechanisms. We also interviewed senior executives to discuss our arguments, results and their implications, and these insights are included in the practical implications section.

Our study contributes to the knowledge perspective on problem solving (Baer et al., 2013; Foss et al., 2016; Nickerson & Zenger, 2004) by developing insights on factors that influence a crucial outcome of problem solving, namely solution effectiveness, and by identifying conditions under which heterogeneity in problem solving groups is beneficial (Baer et al., 2013; Joseph & Gaba, 2020). We contribute to the literature on headquarters-subsidiary relationships (Belenzon et al., 2019; Feldman, 2021; Joseph & Ocasio, 2012; Nell & Ambos, 2013) by examining contingencies to the value that headquarters add to activities occurring in their subsidiaries.

2 | THEORY AND HYPOTHESES

2.1 | Non-routine problem solving and solution effectiveness

The knowledge perspective on problem solving suggests that solving problems is one of the most important sources of firm value creation (Baer et al., 2013; Foss et al., 2016; Nickerson et al., 2012; Nickerson, Silverman, & Zenger, 2007; Nickerson & Zenger, 2004). Problems can be categorized as either routine (day-to-day situations) or non-routine (current organizational action patterns do not offer a predetermined, effective solution), (Nelson & Winter, 1982; Simon, 1977). Especially *non-routine* problem solving can yield solutions that significantly improve firm performance (Felin & Foss, 2009; Nickerson et al., 2007), because it addresses a discrepancy between organizational expectations and reality that cannot be resolved by a firm's current knowledge. As exceptional or discontinuous events that interrupt predetermined everyday organizational activity, symptoms of non-routine problems motivate problem solving, which includes formulating problems and developing solutions (Cyert & March, 1963; Nelson & Winter, 1982). Solutions, through their changes to a firm's products or processes, can renew or develop new capabilities (Nelson & Winter, 1982; Tippmann, Mangematin, & Scott, 2013). For example, COVID-19 restrictions impaired many business processes that relied on face-to-face engagement with suppliers and clients. In response, some firms developed virtual processes and retained effective solutions, thereby modifying firm capabilities (McKinsey, 2020).

However, problem solving only creates value if problems are solved effectively. Ineffective solutions do not improve routines in such a way that a viable predetermined response is available should the same problem re-occur. Instead, additional problem solving attempts will be required (Mitroff & Silvers, 2010). In contrast, when solutions are effective at addressing the problems, current products, services, or organizational practices of firms are extended or modified in beneficial ways (Nickerson et al., 2007; Tippmann et al., 2012).

Despite the importance of developing effective solutions for non-routine problems, prior work has predominantly focused on intermediate outcomes, such as comprehensiveness of problem formulation (Baer et al., 2013), project behaviors (Foss et al., 2016; Tippmann et al., 2017), and knowledge access (Parker et al., 2019), rather than on final outcomes, especially solution effectiveness. Similarly, problem solving in multinational corporations has not specifically investigated solution effectiveness (e.g., Tippmann et al., 2012). Theoretical insights on the antecedents of solution effectiveness are therefore limited. In the remainder of this section, we develop hypotheses regarding the determinants of solution effectiveness.

2.2 | The involvement of senior headquarters managers

Senior subsidiary managers and senior headquarters managers usually have a common interest in effectively solving non-routine problems that arise in subsidiaries. Senior subsidiary managers are incentivized and motivated because the problems directly influence local operations. Senior headquarters managers want to find solutions that can be used in other subsidiaries to maximize gains for the entire corporation (Birkinshaw et al., 1998), and solution effectiveness helps to convince other subsidiaries to adopt a solution (Ciabuschi, Dellestrand & Martín, 2011; Monteiro, Arvidsson, & Birkinshaw, 2008).

Given their interests in effectively resolving non-routine problems in subsidiaries, senior headquarters managers may choose to become involved in problem solving, expecting that their participation improves solution effectiveness (Asmussen, Foss, & Nell, 2019; Foss, 2003). In addition, problem-solving participants may seek to bring in specific senior headquarters managers, also premised on the expectation that their involvement has an overall positive influence on solution effectiveness (Miller, Mors, & McDonald, 2019; Mors, 2010).

Research demonstrates that senior headquarters managers can create value for their subsidiaries and improve their performance (Adner & Helfat, 2003; Feldman, 2021; Kalnins & Mayer, 2004; Parmigiani & Holloway, 2011; Poppo, 2003). For instance, senior headquarters managers can point out complementary assets and activities (Barney, Foss, & Lyngsie, 2018; Belenzon et al., 2019), share new and valuable perspectives (Baer et al., 2013; Tippmann et al., 2017), and span boundaries between different subsidiaries to enable best practice sharing (Kostova & Roth, 2002; Schotter, Mudambi, Doz, & Gaur, 2017). However, senior headquarters managers' contributions are valuable only under the assumptions that they know which knowledge is appropriate and that their involvement does not influence the process negatively. In domestic, single-business firms, headquarters are more knowledgeable about their subsidiaries compared to international or multi-business contexts. Therefore, the assumption that senior headquarters managers make suggestions that fit the requirements and constraints of a subsidiary likely holds. For instance, Parmigiani and Holloway (2011) studied domestic single-business firms (casual dining chains in the U.S.) and found that collocation of parents and business units in the same city improved parenting and business unit performance. Similarly, Kim, Cunningham, and Joseph (in press) showed that proximity to headquarters improves business unit search following product failure in the U.S. medical device industry. Yet, we contend that these assumptions are often violated in contexts where headquarters and subsidiaries operate in different environments (e.g., in different countries, as is the case in our study; Hennart, 1982; Kostova & Roth, 2002). As a result, the involvement of senior headquarters managers often generates conflict (Holm, Decreton, Nell, & Klopf, 2017; Joseph & Gaba, 2020) because the content they contribute is not appropriate and their involvement negatively influences the problem-solving process by diminishing knowledge sharing among subsidiary employees.

Our first argument relates to the *content* that senior headquarters managers bring to problem solving. For senior headquarters managers to provide knowledge facilitating problem formulation and solution development (e.g., new perspectives, tools, referrals), they need to have a sufficiently deep understanding of the contexts in which the problems occur (Nell & Ambos, 2013). Yet, senior headquarters managers often lack such understanding (Bouquet, Birkinshaw, & Barsoux, 2016; Ciabuschi, Forsgren & Martín, 2011), and their suggestions can be at odds with what subsidiary employees can or should do (Holm et al., 2017; Krühler, Pidun, & Rubner, 2012). Moreover, Martin & Eisenhardt (2010, p. 278) showed that headquarters managers have "blind spots" and frequently miss important issues, such as customer concerns, when they become involved in activities occurring in their subsidiaries. Neglecting or misunderstanding important issues or stakeholders

can prove detrimental when formulating the problem, and it can also be harmful for solution development. In fact, senior headquarters managers often undertake negative transfers, that is, they apply practices and available solutions to similar problems solved elsewhere in the organization in contexts that are different and without adjusting the practices accordingly (Holm et al., 2017; Novick, 1988). Thereby, senior headquarters managers bring additional knowledge that is often not suitable. While all individuals engaged in problem solving may potentially contribute irrelevant knowledge, it is particularly problematic in the case of senior headquarters managers because their knowledge is unlikely to be disregarded.

Our second argument relates to how the involvement of senior headquarters managers influences the *process* through which the problem solving unfolds. The involvement of senior headquarters managers often disrupts, albeit involuntarily, the dynamics of the group engaged in solving the problems in ways that impair problem formulation and solution development. More precisely, fear of evaluation and perceived lack of control by subsidiary employees may increase when senior headquarters managers become involved. When senior headquarters managers are involved, subsidiary employees may believe that their inputs are inappropriate, will not be taken seriously, or that they will be sanctioned for speaking up (Reitzig & Maciejovsky, 2015). For instance, subsidiary employees can decide to refrain from speaking up, fearing that this would backfire, when senior headquarters managers formulate problems too narrowly, inappropriately, or when they neglect problem formulation altogether (Mitroff & Featheringham, 1974; Niederman & DeSanctis, 1995). Similarly, subsidiary employees can decide to conceal a local constraint that would highlight the difficulty of implementing a solution brought forward (prematurely) by a senior headquarters manager. Also, when senior headquarters managers are directly involved in their subsidiaries' affairs, subsidiary employees may feel that they are losing control over their task environment. This situation occurs if senior headquarters managers exercise unilateral fiat and leave little room for the participation of subsidiary employees (Martin & Eisenhardt, 2010), which can lead to reduced motivation, psychological withdrawal, and organizational silence (Asmussen et al., 2019; Foss, 2003; Morrison & Milliken, 2000; Parker, 1993). Therefore, the involvement of senior headquarters managers will be related to fewer debates and to subsidiary employees being less collaborative and less engaged. Subsidiary employees sharing less knowledge is detrimental at all stages of the problem solving, from problem formulation to solution development, and will eventually reduce solution effectiveness.

Overall, when senior headquarters managers are involved in problem-solving taking place in their subsidiaries, there is potential to increase solution effectiveness. Yet we predict that this potential is not often realized when problems occur in foreign subsidiaries and that, on average, their involvement results in solutions that are less effective.[1]

> **Hypothesis (H1).** The involvement of senior headquarters managers in non-routine problem solving in subsidiaries is negatively related to solution effectiveness.

2.3 | The involvement of senior headquarters managers and senior subsidiary managers

We develop two theoretical arguments for the moderating role that the involvement of senior subsidiary managers has on the content and process mechanisms that explain the relationship

[1]We predict a linear effect because the counter-productive mechanisms are at play even for low levels of senior headquarters managers' involvement. We found no evidence of a curvilinear relationship (see the robustness tests).

between the involvement of senior headquarters managers and solution effectiveness. Senior subsidiary managers may be involved for reasons similar to those of senior headquarters managers, including their diverse knowledge and perspective as well as information on complementary assets and activities. Importantly, the involvement of senior headquarters managers does not mean that senior subsidiary managers are also involved. Many reasons explain why senior subsidiary managers may not be involved despite the participation of senior headquarters managers (e.g., to focus on other tasks).[2] Yet if senior headquarters and senior subsidiary managers are involved, two mechanisms mitigate the conflicting situations resulting from the involvement of senior headquarters managers (Joseph & Gaba, 2020).

First, related to the content that senior headquarters managers bring to the problem solving, senior managers from the subsidiary at which the problem occurs can guide senior headquarters managers regarding which knowledge is needed and valuable, by sharing insights on possibilities and requirements of the local context. The guidance that senior subsidiary managers provide is likely to establish a shared focus of attention and enhance knowledge recombination for more effective problem solving (Berry, 2014; Joseph & Ocasio, 2012). By acting as boundary spanners between the subsidiary and the headquarters, senior subsidiary managers can translate and transform elements of the problem and its context to senior headquarters managers (Tippmann et al., 2017). As a result, senior headquarters managers will better understand the problem's specificities, which will benefit problem formulation and solution development. Senior subsidiary managers are also in a sufficiently powerful position to debate and negotiate with senior headquarters managers as well as refute their opinions and suggestions when necessary (Martin, 2011). For example, Holm et al. (2017) showed that senior headquarters managers can adjust their initial suggestions after senior subsidiary managers pushed back and highlighted implementation difficulties. Thus, when senior subsidiary managers are involved, the value-adding potential of senior headquarters managers is more likely to be realized as they will be guided to bring knowledge that is useful. Consequently, it will be more likely that problem formulation is comprehensive and that appropriate solutions are developed.

Second, we predict that the involvement of senior subsidiary managers mitigates the negative influence of senior headquarters managers on the process through which individuals solve problems. The involvement of senior subsidiary managers reduces the individual withdrawal and silence among subsidiary employees of the problem-solving group that may be induced by the involvement of senior headquarters managers. Senior subsidiary managers are more empowered to resist any unilateral fiat of senior headquarters managers (Holm et al., 2017), and they can translate and transform the suggestions of their own employees so that their ideas are better understood and heard by senior headquarters managers (Burgelman, 1983; Tippmann et al., 2017). Moreover, individuals are typically biased in favor of ideas from members of their own unit (Reitzig & Sorenson, 2013). Thus, in the presence of senior headquarters managers, senior subsidiary managers are likely to endorse the suggestions brought forward by their own employees. As a result, subsidiary employees will be more confident in the quality and validity of their own suggestions (Birkinshaw & Fry, 1998) and more motivated to share their knowledge, as they feel more in control with regard to solving the problem (Reitzig & Maciejovsky, 2015). By being more likely to speak up and collaborate actively in problem solving, subsidiary employees will contribute to more comprehensive problem formulation and better solution development.

[2]Akin to why senior headquarters managers may be involved, senior subsidiary managers may be involved (or not) for various reasons. Overall, the multiplicity of these reasons may make the involvement appear to be random. Nevertheless, we do account for potential selection issues.

Hypothesis (H2). The involvement of senior subsidiary managers in non-routine problem solving occurring in their subsidiaries positively moderates the negative relationship between the involvement of senior headquarters managers and solution effectiveness.

2.4 | Problem locus and the involvement of senior headquarters managers

A distinction can be made between non-routine problems that have an external locus (i.e., problems primarily related to products and services) or an internal locus (i.e., problems primarily related to processes; Bertrand & Mol, 2013; Leiponen & Helfat, 2010). This distinction is important because problem locus influences the types of knowledge necessary to solve problems.

Products and services must match the requirements and constraints of the environment, including the forces posed by customers, suppliers, competitors, legislation, and other stakeholders (Porter, 2008). When problems with an external locus occur in subsidiaries of multinational corporations, senior headquarters managers are likely to lack such detailed knowledge. In fact, it would be overwhelming for senior headquarters managers to know the specificities of the different external contexts in which their subsidiaries operate—and such an awareness is not expected of them (Belenzon et al., 2019). As a result, senior headquarters managers involved in solving non-routine problems with an external locus are likely to make suggestions that will distract from effectively addressing the problem. Senior headquarters managers are at risk of not formulating the problem in a comprehensive way because they lack sufficient understanding of customer needs (Martin & Eisenhardt, 2010); they are also likely to suggest solutions that are not implementable due to lacking legitimacy in the local context (Kostova & Roth, 2002). Thus, the involvement of senior headquarters managers is unlikely to result in effective solutions when problems have an external locus.

Solutions for problems with an internal locus target improvements in how the firm conducts its activities. While some knowledge about the competitive environment might be needed, a more substantial part of the knowledge required to address these problems relates to the inner workings of the firm (Nelson & Winter, 1982), and senior headquarters managers likely possess relevant knowledge of the processes used in their subsidiaries. Such processes might have been developed at headquarters and rolled out in multiple subsidiaries; or senior headquarters managers may be familiar with similar processes in other subsidiaries because of attempts to standardize best practices across the corporation. Therefore, the involvement of senior headquarters managers in problems with an internal locus is likely to contribute valuable knowledge that helps address the problems effectively. Specifically, senior headquarters managers are likely to frame the problem effectively as well as provide appropriate solutions, because they are aware of their potential and limits. In sum, problem locus is an important contingency with opposing effects, more formally:

Hypothesis (H3). The involvement of senior headquarters managers in non-routine problem solving in subsidiaries is negatively (positively) related to solution effectiveness when problems have an external (internal) locus.

3 | METHODS

3.1 | Sample

Our unit of analysis is the problem-solving project, and we collected data on 120 projects. In total, 60 subsidiaries located in 16 European countries from 40 multinational corporations participated in this study. Most of the data (74 observations) were collected from subsidiaries located in the U.K. and Ireland, and the remainder from subsidiaries located in other European countries (46 observations). All subsidiaries were foreign subsidiaries, that is, the headquarters were in another country. We sampled widely to achieve greater generalizability and the subsidiaries varied in terms of their characteristics at the corporate and subsidiary levels. At the corporate level this variance included different industries (21 ICT, 10 pharmaceutical, 9 from other industries) and sizes (mean turnover = $30.6 billion with SD = $33.7 billion, mean number of employees 76,500 with SD = 92,100). Subsidiaries varied in terms of age (mean = 22.47 years with SD = 21.58), size (mean = 860 employees with SD = 1,052), and mode of establishment (48 greenfield and 12 acquisitions). Subsidiaries in our sample were structured in ways that enable them to perform a wide range of functions. Eighty-five percent of the subsidiaries in our sample performed three or more value chain functions (e.g., manufacturing, marketing, sales of product or service, R&D, logistics; mean = 4 activities with SD = 1.5). Most subsidiaries operated with limited autonomy. Financial performance was reviewed at least monthly in 87% of the subsidiaries in our sample while resource allocation was reviewed at least quarterly in 70% of them.

All problem-solving projects had to fulfill three criteria. First, projects had to have ended within the preceding 12 months—recently enough for our informants to recall events accurately. Second, the problem-solving project must have been initiated by the subsidiary as opposed to being mandated or driven by headquarters or another subsidiary. Third, each project needed to be in response to a non-routine problem. The subsidiary manager (General Manager, Managing Director, or Director) was asked to identify all problem-solving projects that fit these criteria. The problem-solving projects were therefore non-routine for the subsidiary, but not necessarily for the overall firm. On average, two projects were identified in each subsidiary (min = 1 and max = 8), and we included all of them in our sample. Projects occurred in different functional areas: marketing/sales in 37 cases (30.8%), manufacturing in 26 cases (21.7%), services/support in 24 cases (20.0%), back-office support in 17 cases (14.2%), R&D in 8 cases (6.7%), and supply chain/logistics in 8 cases (6.7%). Importantly, while including in the sample instances of problem solving that had already ended is a necessary condition to assess solution effectiveness, the firm's closure of the problem-solving project does not equate to *effective* problem solving. In fact, the problem-solving projects in our sample varied in their outcomes.

3.2 | Data collection

Companies generally do not track problem-solving projects in a systematic manner and neither did the companies in our sample. We therefore collected survey data for hypotheses testing. Before data collection, five academics and four subsidiary managers assessed the face validity of our questionnaire. We undertook necessary amendments to ensure question clarity.

We used three different questionnaires to collect information: in the first questionnaire, the project leader responsible for the problem solving reported on characteristics of the problem

and problem solving (e.g., the individuals involved), a senior manager in the subsidiary answered questions about the solution achieved in the second questionnaire. The outcome variables were thus always informed by a different manager than the information on the project (e.g., who was involved), which eliminated common method bias. Information on the organizational context of the subsidiary, our third questionnaire, was informed by a third manager or by the subsidiary top manager who also responded to the second survey.

We researcher-administered the survey for the project leader, which allowed clarifying questions when needed, detecting potential inconsistencies in answers, and listening to more detailed examples or specific illustrations. The other two surveys (solution and subsidiary organizational context) were personally addressed and administered via email. In total, 125 project leaders and 71 subsidiary managers participated, totaling 196 unique respondents, with an average of 2.2 respondents per project.[3] To encourage accurate responses and reduce the possibility of social desirability, we emphasized the confidentiality of answers, anonymized responses, and guaranteed to present results only in aggregated format.

A name generator question in the questionnaire to the project leader captured data on the individuals involved. A name generator is useful for studying social structures if it is impractical to generate a predetermined roster of all possible participants (e.g., Mors, 2010). The name generator focused on supportive exchanges in the problem-solving project, that is, it featured behavioral linkages rather than affect-based recalls (Bell, Belli-McQueen, & Haider, 2007). Thus, our approach leads to the inclusion of weak ties, countering the potential bias of recalling primarily strong ties. The phrasing of the name generator question included prompts to different ways of involvement, which helps to counter the effects of forgetting. Respondents could name up to 10 people and we asked how many people were important in addressing the problem if 10 people were named. More than 10 people were important in 21 of the 120 problems (17.5%). Yet, on average, 7.92 people were important (min = 1, max = 25, SD = 4.19), suggesting that our data offers an extensive view on the most important participants.

3.3 | Measures

3.3.1 | Dependent variable: Solution effectiveness

Solution effectiveness varies. Some solutions are "acceptable solutions" (Jeppesen & Lakhani, 2010, p. 1016), others are "sub-optimal" ones (Baer et al., 2013), and yet others are effective at addressing the problem (Caner, Cohen, & Pil, 2017). Our holistic conceptualization of solution effectiveness requires a measure that is useful across problems, firms, and industries. Performance measures such as sales increase or process efficiency gains captures improvements, but not necessarily the extent to which the solution effectively solved the problem. Comparing improvements achieved versus an initial target could be closer to effectiveness, but may result in context-specific measures with limited usefulness for comparisons across different types of problems, firms, and industries. For instance, two solutions can reach the initial target, but one solution may generate negative externalities, which would make the solution less effective at addressing the problem. To further illustrate, consider the problem of a new local regulation forcing a subsidiary to adjust the way it collects consumer data (e.g., the General Data

[3]When two managers within the subsidiary were appointed as joint project leaders ($n = 5$), we interviewed them simultaneously to arrive at agreed answers.

Protection Regulation). The problem could be solved by adjusting internal processes. Yet the solution can be more or less effective. For instance, a solution in which consent can be withdrawn only through cumbersome ways for consumers will reduce consumer satisfaction. All else equal, such a solution would be less effective than another one in which consumer satisfaction is not reduced. Given our interest in measuring the success of implemented solutions in addressing the non-routine problem in a holistic way, we derived three items to measure solution effectiveness using an established question phrasing (Atuahene-Gima, 2003). Senior subsidiary managers were asked: "Every problem-solving process faces technical, operational, and other challenges. Focusing on the end result, to what extent to you agree or disagree with the following statements?" (7-point Likert scale, ranging from 1 = totally disagree to 7 = totally agree). The items included: (1) "The solution found was adequate to resolve the initial problem," (2) "The solution found achieved its intended outcome," (3) and "The solution found was not fit for purpose" (reverse coded) ($\alpha = 0.78$). All items loaded on one factor.[4]

3.3.2 | Independent variables

We assessed the *involvement of senior headquarters managers* by measuring the number of senior managers from headquarters involved in the problem-solving project. Specifically, we counted the number of headquarters managers listed in the name generator who were higher in the hierarchy than the project leader (i.e., senior).[5] Importantly, the comparative hierarchical level does not imply that individuals are in the same reporting line. The *involvement of senior subsidiary managers* was measured using the same procedure as the one with senior headquarters managers. We assessed *problem locus* by considering whether the problem related primarily to the firm's products and services (external locus) or primarily to the processes through which the firm conducts its activities (internal locus). Our problem locus variable equals 0 if the locus is external and 1 if the problem has an internal locus.

3.3.3 | Control variables

We controlled for *industry* as it may affect choices and consequences related to the involvement of senior headquarters managers in their subsidiaries (Nell & Ambos, 2013). We added dummy variables controlling for firms in the ICT and pharmaceuticals industries, in which firms tend to follow global strategies and operate with high centralization of decision-making (Doz & Prahalad, 1981). The reference category is other industries such as fast-moving consumer goods and retail banking, in which firms tend to follow multi-domestic strategies (Jarillo & Martínez, 1990) characterized by decentralized decision-making and low headquarters involvement in subsidiaries (Doz & Prahalad, 1981). We controlled for *headquarters monitoring* to account for approaches to managing subsidiaries (O'Donnell, 2000). We asked subsidiary managers to rate "How frequently is information in each of the following subsidiary unit reviewed by headquarters?" (Ambos, Andersson, & Birkinshaw, 2010). The items included budgeting process, resource allocation, and capital equipment purchases; and the scale ranged from 1 = daily to 7 = never (reversed) ($\alpha = 0.78$). We included a control variable for the *geographic distance*

[4]Using the average score or a binary one (above average or not) did not alter our results.

[5]Using a measure capturing the intensity of involvement between senior headquarters managers and the project leader did not alter our results.

(in kilometers) between the subsidiary and headquarters. We controlled for *subsidiary size* measured by the number of full-time employees and for *subsidiary age* measured as the number of years between the establishment or acquisition of the subsidiary and the problem-solving project.[6] We included a variable to control for *low past subsidiary performance* as this might influence our variables of interest. We asked subsidiary top managers to indicate the performance of their subsidiary relative to the corporation over the previous 5 years (below average, average, and above average), according to a financial and managerial indicator (Ambos et al., 2010). Our subsidiary performance control takes the value of 1 if either the managerial indicator (productivity) or financial indicator (profitability) was rated "below average," and 0 otherwise. To control for the *functional area* of a problem, we included a variable that equals 1 if the problem occurred in a department undertaking upstream activities (i.e., R&D, manufacturing, shared services, and back office) and 0 otherwise (i.e., sales, logistics, marketing) (Bouquet & Birkinshaw, 2008).[7] We controlled for the number of individuals involved in the problem-solving project (i.e., *problem solving group size*).[8] We accounted for *problem solving duration*, measured in months.[9] We controlled for *problem complexity* (Baer et al., 2013) and asked respondents "To what extent did the problem..." (1) "Involve a large number of variables, many of which were not directly observable (i.e., symptoms are known, but the cause is unknown)," (2) "Involve a high degree of connectivity among the elements of the problem (i.e., change in any one variable will affect other variables)," and (3) "Involve a dynamic component (i.e., the pattern of interaction is changing over time)" (7-point scale). Our problem complexity measure was constructed formatively as the cube root of the product of the equally weighted items (see Larsen, Manning, & Pedersen, 2013). We controlled for the average *collaboration intensity* between individuals involved in the problem-solving project. Project leaders indicated their perceptions of how intensely each pair of individuals collaborated on solving the problem (i.e., actively working together, excluding mandatory updates and communications) (from 1 = not intensely at all [i.e., no active collaboration] to 4 = very intensely). Our collaboration intensity variable was measured as the average intensity score between pairs of individuals within the problem-solving group. Finally, we controlled for the *involvement of senior managers from other subsidiaries* using the same procedure as for our other involvement variables.

4 | RESULTS

We first present results from ordinary least squares (OLS) regression.[10] Then we test the robustness of these analyses using propensity-score matching to compare problem-solving projects

[6]A measure of relative subsidiary size (subsidiary size/firm size) was not meaningful as 77% of the subsidiaries in our sample represented less than 5% of the total number of employees in their firms. Including a dummy that equals 1 if relative subsidiary size was more than 5% did not alter our models and was not significant.

[7]Running our analyses with dummy variables for each function did not alter our results.

[8]93% of the problem solving projects in our sample included fewer than 60 individuals. Running our models excluding projects with more than 60 individuals did not alter our results.

[9]92% of the problem-solving projects in our sample lasted less than 24 months. We ran our analyses excluding projects that lasted more than 24 months and the results were consistent with our main results.

[10]We used a linear model and not an ordered model for two reasons. First, our dependent variable is the factor score generated from three items measured on a 7-point scale. Thus, our final measure can take 31 real values. Treating a variable as continuous should not result in biases when it has 5 or more categories (Greene, 2003). Second, the use of ordered logit/probit regression greatly complicates interpretation of interaction effects. Nevertheless, we tested the robustness of our results using ordered logit and probit estimations.

that had similar likelihoods of experiencing the involvement of senior managers (from both headquarters and the subsidiary) (Rubin & Thomas, 2000). Next, we use a Gaussian copula model to capture the correlation between the involvement of senior managers and the structural error (Park & Gupta, 2012). Finally, we present various robustness tests.

4.1 | OLS regressions

We tested assumptions of linearity, normality of residuals, and undue outliers, but these analyses did not cause major concerns. Our models are stable to the exclusion of unduly influential observations. Diagnostics did not show heteroscedasticity concerns and variance inflation factors were all below 6 in our final model (average 2.04).[11] We clustered standard errors by firm.

Table 1 reports descriptive statistics and correlations, Table 2 the OLS results. Model 1 includes only control variables; Models 2–5 include control variables and our independent variables. We focus on Model 5, which includes all variables. Our headquarters monitoring control variable is positively related to solution effectiveness ($\beta = 0.168$; $p = .032$). This result can be explained because greater headquarters monitoring reflects closer parental oversight, likely encouraging subsidiaries to address non-routine problems effectively. The problem-solving group size variable shows that problem-solving projects engaging a larger number of individuals are less likely to be solved effectively ($\beta = -0.007$; $p = .002$). Our problem complexity variable shows that complex problems are solved more effectively ($\beta = 0.127$; $p = .035$), possibly due to extra effort devoted to them to avoid undermining subsidiary credibility. Finally, the involvement of senior subsidiary managers was not significantly related to solution effectiveness.

In Hypothesis (H1) we predict that the involvement of senior headquarters managers is negatively related to solution effectiveness. Our results are consistent with this hypothesis ($\beta = -0.396$; $p = .003$). Concretely, all else equal, the involvement of an additional senior headquarters manager reduces our solution effectiveness score by 0.396 (approximately half a standard deviation or ~9%). In Hypothesis (H2) we predict that the interaction of the involvement of senior managers from headquarters and from the subsidiary is positively related to solution effectiveness. Results are consistent with this hypothesis ($\beta = 0.127$; $p = .022$). Additional analyses show that the involvement of senior headquarters managers is negatively related to solution effectiveness when the involvement of senior subsidiary managers is below 1.11 (at $p < 0.10$; 63% of our final sample) and that this relationship is positive when the involvement of senior subsidiary managers is above 4.50 (at $p < 0.10$; 5% of our final sample; see Figure 1).

Hypothesis (H3) predicts that the involvement of senior headquarters managers is negatively (positively) related to solution effectiveness when problems have an external (internal) locus. Regression results show that the involvement of senior headquarters managers is more negatively related to solution effectiveness for problems with an external focus than for those with an internal one ($\beta = 0.190$; $p = .064$). Yet analyses of average marginal effects (AME) could not reject part of the null hypothesis. The involvement of senior headquarters managers is negatively related to solution effectiveness when problems have an external locus (AME = −0.227; $p = .005$), but this relationship is not significant when problems have an internal locus (AME = −0.037; $p = .630$; see Figure 2).

[11]In the final model "involvement of senior headquarters managers" is included three times, which generates VIF that go up to 5.81. All other VIF are below 3.02 in the final model.

TABLE 1 Descriptive statistics and correlations.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Solution effectiveness	1																
2	ICT	0.057	1															
3	Pharma	0.148	−0.722	1														
4	Headquarters' monitoring	0.126	0.001	0.003	1													
5	Geographic distance (log)	0.125	0.280	−0.130	0.012	1												
6	Subsidiary size (log)	−0.044	0.106	−0.274	0.264	0.097	1											
7	Subsidiary age (log)	0.180	−0.007	0.152	−0.260	−0.042	−0.102	1										
8	Low past subsidiary performance	−0.060	−0.008	−0.103	0.003	0.038	−0.032	−0.099	1									
9	Problem locus	0.115	−0.123	0.072	0.012	0.058	0.097	−0.056	−0.003	1								
10	Problem function	0.137	0.136	−0.014	−0.025	0.267	0.152	−0.139	−0.200	0.314	1							
11	Problem-solving group size	−0.254	0.023	−0.260	0.123	0.015	0.260	−0.134	−0.039	−0.057	−0.008	1						
12	Problem-solving duration	0.043	0.116	−0.096	−0.006	−0.007	0.007	−0.090	−0.136	0.106	0.133	0.240	1					
13	Problem complexity	0.154	0.205	−0.233	0.082	0.153	0.192	0.080	−0.185	−0.045	0.162	0.211	0.013	1				
14	Average collaboration intensity	0.090	0.034	−0.026	0.055	−0.142	0.075	−0.052	0.001	−0.003	0.018	0.118	0.004	0.008	1			
15	Involvement of senior managers from other subsidiaries	0.079	0.249	−0.126	−0.004	0.311	−0.072	0.030	0.101	0.045	0.205	−0.027	0.106	0.209	−0.027	1		
16	Involvement of senior managers from the subsidiary	0.011	−0.108	0.004	0.097	−0.105	0.247	−0.038	−0.191	0.009	0.035	0.175	0.002	0.006	−0.015	−0.178	1	

TABLE 1 (Continued)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
17	Involvement of senior managers from headquarters	−0.257	0.040	−0.098	0.044	0.065	−0.025	−0.292	0.121	−0.053	−0.104	0.159	0.048	−0.019	−0.105	0.023	−0.182	1
	Mean	0	0.35	0.49	0	7.87	5.96	2.66	0.27	0.78	0.6	24.1	11.69	4.37	2.94	0.49	1.33	0.71
	Minimum	−3.29	0	0	−1.81	5.76	2.56	0	0	0	0	2	1	1.59	1.33	0	0	0
	Maximum	1.11	1	1	2.92	9.18	8.43	4.87	1	1	1	300	115	7	4	5	7	4
	Standard deviation	0.84	0.48	0.50	0.85	1.05	1.39	1.04	0.44	0.41	0.49	33.97	13.35	1.43	0.50	0.80	1.46	0.99

Note: All correlations greater than |0.180| are significant at the 5% level.

TABLE 2 Results from OLS regression predicting solution effectiveness.

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5
ICT	0.271	0.284	0.271	0.295	0.287
	(0.225)	(0.228)	(0.234)	(0.230)	(0.237)
Pharma	0.354	0.363	0.352	0.386	0.390
	(0.215)	(0.217)	(0.225)	(0.217)	(0.227)
Headquarters' monitoring	0.188	0.183	0.170	0.184	0.168
	(0.071)	(0.069)	(0.073)	(0.069)	(0.075)
Geographic distance headquarters-subsidiary (log)	0.092	0.096	0.095	0.103	0.106
	(0.062)	(0.061)	(0.062)	(0.061)	(0.065)
Subsidiary size (log)	−0.039	−0.040	−0.030	−0.041	−0.030
	(0.044)	(0.046)	(0.046)	(0.045)	(0.045)
Subsidiary age (log)	0.149	0.110	0.098	0.108	0.092
	(0.057)	(0.060)	(0.063)	(0.061)	(0.065)
Low past subsidiary performance	0.099	0.108	0.100	0.119	0.117
	(0.160)	(0.156)	(0.161)	(0.154)	(0.160)
Problem locus is internal	0.180	0.176	0.229	0.088	0.087
	(0.125)	(0.117)	(0.118)	(0.158)	(0.152)
Problem function is upstream	0.106	0.069	0.069	0.075	0.079
	(0.167)	(0.157)	(0.151)	(0.162)	(0.156)
Problem-solving group size	−0.007	−0.006	−0.007	−0.006	−0.007
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Problem-solving duration	0.008	0.008	0.007	0.008	0.007
	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)
Problem complexity	0.121	0.120	0.126	0.120	0.127
	(0.060)	(0.058)	(0.058)	(0.058)	(0.058)
Average collaboration intensity	0.236	0.201	0.201	0.202	0.204
	(0.148)	(0.155)	(0.146)	(0.155)	(0.142)
Involvement senior managers from other subsidiaries	−0.045	−0.044	−0.038	−0.048	−0.043
	(0.072)	(0.078)	(0.084)	(0.076)	(0.081)
Involvement senior managers from same subsidiary	0.054	0.036	−0.017	0.042	−0.015
	(0.038)	(0.038)	(0.048)	(0.036)	(0.049)
Involvement senior managers from headquarters		−0.131	−0.243	−0.209	−0.396
		(0.066)	(0.083)	(0.072)	(0.127)
Involvement senior managers from headquarters			0.109		0.127

TABLE 2 (Continued)

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5
Involvement senior managers from the subsidiary			(0.043)		(0.054)
Involvement senior managers from headquarters				0.111	0.190
Problem locus is internal				(0.100)	(0.099)
Constant	−2.575	−2.282	−2.263	−2.292	−2.277
	(0.717)	(0.714)	(0.652)	(0.726)	(0.662)
Observations	120	120	120	120	120
R-squared	0.250	0.269	0.289	0.273	0.298
Adjusted *R*-squared	0.142	0.156	0.171	0.151	0.173

Note: Robust standard errors clustered at the firm level in parentheses.

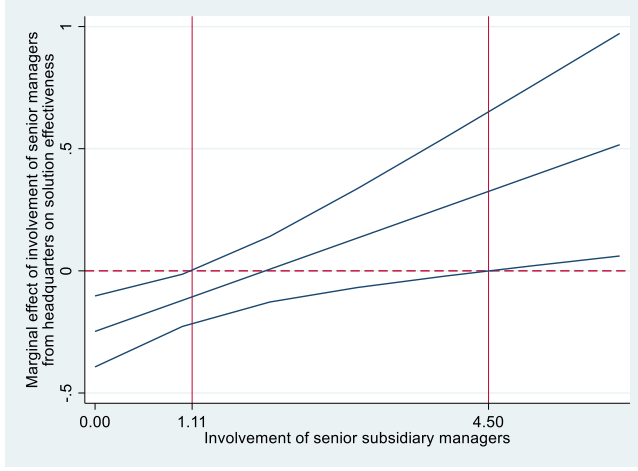

FIGURE 1 Average marginal effect of "Involvement of senior managers from headquarters" on "Solution effectiveness," by "Involvement of senior subsidiary managers" (with 90% confidence intervals).

In sum, our results are consistent with the arguments that the involvement of senior headquarters managers in problem solving occurring in their subsidiaries reduces solution effectiveness, especially if problems have an external locus and unless senior subsidiary managers are involved.

4.2 | Propensity score matching

It is not possible to observe the effectiveness that the solution would have had in the event that senior headquarters managers had not been involved and vice versa. Propensity-score matching helps address this issue by matching pairs of problem-solving projects, one with the involvement of senior managers from headquarters, the other without, that have a similar likelihood

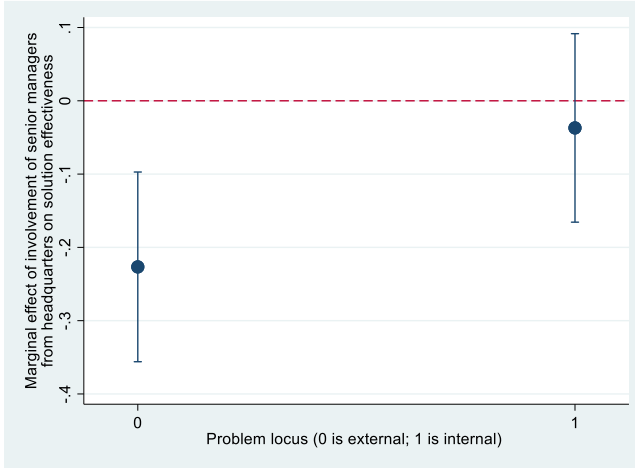

FIGURE 2 Average marginal effect of "Involvement of senior managers from headquarters" on "Solution effectiveness," by "Problem locus" (with 90% confidence intervals).

to experience such involvement. We started by assessing the risk of omitted variable bias because it can yield inaccurate propensity scores (Rosenbaum & Rubin, 1983). A regression specification error test for omitted variables failed to reject that our model was specified correctly. We also calculated the "impact threshold for a confounding variable" (ITCV) (Busenbark, Yoon, Gamache, & Withers, 2022; Frank, 2000). To invalidate our results related to the involvement of senior headquarters managers, the omitted variable would need to have an impact 2.6 times higher than the impact of the strongest covariate in our final model. Similar tests for the involvement of senior subsidiary managers also indicated no reason for concern. These analyses provide confidence that our results are unlikely to be driven by a correlated omitted variable. Next, we generated a dummy variable that equals 1 if our variable "involvement of senior headquarters managers" is different from 0.[12] Propensity scores obtained from a first-stage model explaining the involvement of senior headquarters managers were used to identify pairs of problem-solving projects. Each treatment observation (with senior headquarters managers involved) was matched to a control observation (without senior headquarters managers involved) whose propensity score fell within a given caliper.[13] Observations that could not be matched were discarded. Tables A1 and A2 in the Appendix include unmatched and matched comparisons (balance tests) of the treatment and control groups. First-stage regression results are included in Tables A3 and A4.[14] Exclusion of deficient matches resulted in a sample with 39 and 69 observations in the treatment and control groups, respectively.[15]

[12]Results are stable when the treatment variable equals 1 if our variable "involvement of senior headquarters managers" is strictly above average. Additionally, we ran propensity score matching analyses with the treatment referring to "involvement of senior subsidiary managers." Results are robust within this specification as well.

[13]We used a caliper width of 0.01. The matching is robust to the use of wider and narrower caliper widths as well as nearest neighbor without replacement.

[14]We included all covariates in these analyses but the results as well as the treatment-effect estimations are stable to analyses including different combinations of variables as well as to estimations using logit and probit regression.

[15]Pirracchio, Resche-Rigon, and Chevret (2012) ran Monte Carlo simulations to evaluate the influence of sample size on the Type I error rate in propensity score matching analysis. Decreasing sample size from 1,000 to 40 did not substantially alter the Type I error rate.

Some observations had a strong impact on the balance and could not be matched. These were mostly outliers on some dimensions (e.g., duration) whose inclusion/exclusion from our main analyses did not affect the results. Finally, we estimated our model on the matched subsample. Results are highly similar to the OLS regression without propensity score matching (see Tables A3 and A4 in the Appendix), raising confidence that our main analyses are not subject to omitted variable and selection biases.

4.3 | Gaussian copula model

To further account for potential endogeneity issues—and given the difficulty of finding instruments that do not violate the exclusion restriction (Wolfolds & Siegel, 2019)—we estimate our models with an instrument-free Gaussian copula approach (Park & Gupta, 2012). This approach "models the joint distribution of the endogenous variable and the error term and makes inferences on the model parameters by maximizing the likelihood from the joint distribution" (Rutz & Watson, 2019, p. 489). Essentially, this approach treats the endogenous regressor as a random variable from a non-normal marginal population distribution and uses a copula to correlate it with a normal error term. Thereby, the remaining variation in the endogenous variable is no longer compromised and estimates of coefficients are consistent (Rutz & Watson, 2019).

Shapiro–Wilk tests confirmed that the distributions of the endogenous regressors (i.e., involvement of senior headquarters/subsidiary managers) were not normal. We subsequently calculated the generated regressors following the Gaussian copula as $P_1^* = \phi^{-1}(U_{P1})$ and $P_2^* = \phi^{-1}(U_{P2})$, where P_1^* and P_2^* are the copula terms for the involvement of senior headquarters managers and senior subsidiary managers, respectively. ϕ^{-1} represents the inverse normal cumulative distribution function and U_{P1} and U_{P2} represent the empirical cumulative distribution functions of the involvement of senior headquarters and senior subsidiary managers, respectively.[16] P_1^* and P_2^* are then entered as additional regressors in our main model, yielding consistent estimates.[17] Results show that the involvement of senior headquarters managers is not biased ($\beta = 0.133$; $p = .441$) (see Appendix). Similarly, the copula term for the involvement of senior subsidiary managers is not significant ($\beta = 0.077$; $p = .764$). These analyses are consistent with our main results and indicate that we can use the OLS estimations for interpretation.

4.4 | Robustness tests

We conducted a series of robustness tests (available in the Appendix). These tests show that the involvement of senior headquarters managers (a) does not have a curvilinear effect on solution effectiveness, (b) is not significantly related to a variable capturing the solution's importance for other subsidiaries, (c) is negatively related to solution effectiveness when involvement occurs in both stages of the problem solving (problem formulation and solution development), involvement in just one of the two stages was not significant. These tests also show that our results are

[16]The highest observations in the respective distributions, for which U_{P1} and U_{P2} are equal to 1.00, have to be set to a value just below that $(1 - (1/N) = 0.992)$ to avoid an error in the next step.

[17]Standard errors have to be corrected because P_1* and P_2* are estimated and not observed. We bootstrapped the standard errors with replacement to produce a sample of point estimates of the coefficients of interest, wherein the standard deviations of these estimates are used as the standard errors (Park & Gupta, 2012). We present results obtained with 50 bootstrap replications. Results are consistent when performing 100, 150, and 200 replications.

robust when (d) using a sub-sample of subsidiaries that varied strongly in the solution effectiveness scores of their problem solving, (e) controlling for additional variables at the individual, project, subsidiary and firm level, (f) using ordered probit and ordered logit models, (g) running a three-level linear model with random intercept by subsidiary and by firm, (h) excluding the few observations in which the difference in hierarchical level of senior headquarters and senior subsidiary managers was high, and (i) using various operationalizations of our key variables.

4.5 | Post hoc analyses

We ran analyses to verify our theoretical mechanisms. The first argument of our first hypothesis is that the involvement of senior headquarters managers is negatively related to solution effectiveness because senior headquarters managers often lack understanding of the context in which the subsidiary operates. We investigated the correlation between the involvement of senior headquarters managers and solution effectiveness at various levels of geographic distance. If our argument is valid, the involvement of managers who are geographically closer to their subsidiaries—and thus more knowledgeable about the local context—should be less negatively related to solution effectiveness than the involvement of those who are more distant. Indeed, the correlation is negative when geographic distance is in the upper quartile ($r = -.35$, $p = .059$) but not significant when geographic distance is in the lower quartile ($r = -.26$; $p = .170$).

The second mechanism in our first hypothesis is that the involvement of senior headquarters managers is negatively related to solution effectiveness because subsidiary employees fear evaluation by senior headquarters managers and loss of control over their environment, thus participating less in the problem solving. In line with our argument, analyses indicate that there are more intensive collaborations between subsidiary employees when senior headquarters managers are not involved (7.80 vs. 4.82; two-tailed t-test $p = .022$).[18] Analyses show that the missing intensive collaborations between subsidiary employees are not offset by intensive collaborations between subsidiary employees and senior headquarters managers.

The first mechanism of our second hypothesis is that the involvement of senior subsidiary managers mitigates the negative relationship between the involvement of senior headquarters managers and solution effectiveness because senior subsidiary managers can advise senior headquarters managers about the subsidiary's context. In line with our argument, the correlation between the involvement of senior headquarters managers and solution effectiveness is negative when geographic distance is in the upper quartile and senior subsidiary managers are not involved ($r = -.55$; $p = .063$) and nonsignificant when senior subsidiary managers are involved ($r = -.29$; $p = .235$). When geographic distance is in the lower quartile, that is, when senior headquarters managers should be more knowledgeable about their subsidiaries' contexts, the involvement of senior headquarters managers is not significantly related to solution effectiveness, whether senior subsidiary managers are involved or not ($p = .836$ and $p = .111$, respectively).

The other mechanism in our second hypothesis is that when senior headquarters managers are involved, the problem-solving process is disrupted in such a way that subsidiary employees

[18]Intensive collaborations between subsidiary employees were measured as the number of collaborations rated as intensive or very intensive between individuals who were working in the focal subsidiary or in another subsidiary and who were at the same level or lower in the hierarchy than the project leader.

are less likely to speak up and collaborate, unless senior subsidiary managers are also involved. We analyzed differences in intensive collaborations between subsidiary employees when senior headquarters managers are involved and senior subsidiary managers are (and are not) involved. When senior headquarters managers are involved, we found no evidence of increased intensive collaborations between subsidiary employees if senior subsidiary managers are also involved (two-tailed *t*-test; $p = .186$). We also found no evidence of more intensive collaborations between subsidiary employees and senior headquarters managers (two-tailed *t*-test; $p = .429$) when senior subsidiary managers are involved. Instead, what appears to explain the positive marginal effect of the involvement of senior headquarters managers on solution effectiveness at high levels of involvement of senior subsidiary managers is the collaboration between these two types of senior managers, who collaborated more intensely in problems that were solved with a highly effective solution (above average) (two-tailed *t*-test; 2.74 vs. 2.08; $p = .046$).

In our third hypothesis, we predicted that the involvement of senior headquarters managers is especially detrimental when problems have an external locus. Our argument is that solving these problems effectively requires knowledge about the subsidiary's local context, which senior headquarters managers lack. This argument would also explain a different effect depending on the functional area in which problems occur (i.e., downstream or upstream). Indeed, solving problems that deal with downstream functions (sales, marketing or logistics) requires a better understanding of the local context than when problems deal with upstream functions (R&D, manufacturing, back office or shared services). Aligned with our theory, analyses of marginal effects show that the involvement of senior headquarters managers is detrimental to solution effectiveness when problems occur in downstream functions ($\beta = -0.176$; $p = .035$) but not significant when problems occur in upstream functions ($\beta = -0.027$; $p = .761$).

5 | DISCUSSION

5.1 | Summary of the results

We hypothesized that the involvement of senior headquarters managers in non-routine problem solving occurring in their foreign subsidiaries is negatively related to solution effectiveness, unless senior subsidiary managers are also involved. We also predicted that the negative relationship between the involvement of senior headquarters managers and solution effectiveness is especially strong when problems have an external locus. Analyses using detailed data on 120 non-routine problem-solving projects are consistent with our arguments.

5.2 | Contributions to theory

Our main contribution is to the knowledge perspective on problem solving (Baer et al., 2013; Foss et al., 2016; Nickerson et al., 2007, 2012; Nickerson & Zenger, 2004), because our study develops insights on the factors that determine a crucial outcome of problem solving, namely solution effectiveness. So far, research has focused on intermediate outcomes, such as the comprehensiveness of problem formulation (Baer et al., 2013) and problem-solving behaviors (Foss et al., 2016; Tippmann et al., 2017). In terms of solution effectiveness, we demonstrate that the type of senior managers involved (from headquarters and from the subsidiary) and the problem locus are important determinants.

Moreover, our results speak to the notion of heterogeneity in problem-solving groups. Groups composed of heterogeneous members, such as from different units and hierarchical levels, exhibit different ways to gather, interpret, and synthesize knowledge. For instance, individuals in headquarters and subsidiaries, because of their structurally separated interactions, develop different mental models and behaviors (Dutt & Joseph, 2019; Gaba & Joseph, 2013). These differences can be a source of conflicting situations, such as situations in which individuals do not speak up when they disagree with how a problem is being formulated, despite having relevant knowledge they could share (Baer et al., 2013; Joseph & Gaba, 2020). We build on these ideas to establish the conditions under which these conflicting situations can be mitigated. Specifically, senior subsidiary managers appear to be important actors who mitigate conflicting situations in which senior headquarters managers bring in knowledge that does not fit the problem at hand.

Our study also contributes to the literature on headquarters-subsidiary relations (Bouquet & Birkinshaw, 2008; Feldman, 2021; Joseph & Ocasio, 2012; Kim et al., in press; Nell & Ambos, 2013). Some of this research corroborates the positive effects related to the involvement of senior headquarters managers (e.g., Adner & Helfat, 2003; Belenzon et al., 2019; Feldman, 2021; Poppo, 2003). Others have reported that such involvement is not always appropriate or desired and can be detrimental to motivation and innovation (Ciabuschi, Dellestrand & Martín, 2011; Ciabuschi, Forsgren & Martín, 2011; Decreton, Nell, & Stea, 2019). We resolve these puzzling insights by questioning implicit and explicit assumptions in the literature that senior headquarters managers know which knowledge is appropriate to the problem solving, as well as that their involvement does not disrupt the problem-solving process. In so doing, we build on the proposition by Joseph and Ocasio (2012) that interactions between corporate and subunit managers can align attention to drive adaptive organizational change. We report evidence for a combinative approach whereby subsidiary and headquarters managers must collaborate to improve the ability of a problem-solving group to gather, interpret, and synthesize knowledge to develop effective solutions. The role of subsidiary managers is not so much to champion problem-solving initiatives to headquarters for approval and selection (e.g., Bower, 1970; Burgelman, 1983), but rather to ensure that the involvement of senior headquarters managers is appropriate, in terms of content and process, to create effective solutions. Adding to insights on roles of senior subsidiary managers (Birkinshaw et al., 1998; Bouquet & Birkinshaw, 2008; O'Brien, Sharkey Scott, Andersson, Ambos, & Fu, 2019), this demonstrates the importance of their willingness to manage effective relations with their headquarters.

5.3 | Practical implications

We interviewed executives on the corporate level, as well as general managers of subsidiaries with corporate-level experience to discuss our arguments, results, and their implications. An important implication of our study is that subsidiary employees engaged in problem solving should be aware of the potential consequences of senior headquarters manager involvement. Indeed, senior headquarters managers may not possess the knowledge needed to solve the problem. A CFO we interviewed noted that, "the knowhow to understand the specific problem or a solution is not necessarily given in the center [i.e., headquarters]." This issue is particularly common for problems that deal with the external environment. For instance, a company Vice President working in a regional headquarters shared with us the difficulty for senior headquarters managers to help addressing non-routine problems that deal with local laws. A corporate

headquarters executive emphasized: "What might feel as a small deal from a headquarters standpoint can have massive impact at the country or regional level." The involvement of senior headquarters managers can also distract from addressing the problem. The general manager of a regional headquarters pointed out that "everything becomes more complex when the headquarters are landing in your backyard. You spend more time aligning, there are more people involved. This is not necessarily good." Moreover, the involvement of senior headquarters managers can reduce the participation of subsidiary employees, as one senior corporate headquarters executive pointed out: "Accountability of local teams drops when corporate is involved. And that comes with a drop of motivation and eventually a drop of engagement from the local teams." Another major implication of our study is that the involvement of senior headquarters managers can become an asset if senior headquarters managers and senior subsidiary managers are jointly involved. As one executive put it: "In our company, the subsidiary manager has a key role, a clip or stapling role, to hold and bring everything together and to improve overall communication. It is a key coordination role." A longstanding CEO of a large subsidiary noted that "after all, the local top management's job is to align all stakeholders—also those from the headoffice—so the alignment with the headoffice is crucial. [...] The problem is that local top management might not be aware of all headoffice involvement, because there are no clearly defined processes that govern their involvement. And when I am not involved, then I cannot perform the role of balancing the stakeholders."

5.4 | Limitations and direction for future research

This study has limitations that offer exciting avenues for future research. First, to investigate solution effectiveness, the problem-solving projects we studied had to be completed (i.e., a solution was found for all problems, even if not an effective one). While solutions varied in their effectiveness, our study cannot inform about problems for which no solution was found. Future research could investigate how solutions are found and the role of various types of senior managers in this regard. Relatedly, as much as our conceptualization and measurement of solution effectiveness was holistic and enabled comparison across problems, firms, and industries, it did not capture objective performance. Future research could use contexts that enable comparison using objective performance measures. Second, the non-routine problems included in our study were faced by these subsidiaries for the first time, but we acknowledge that solving non-routine problems may require multiple attempts. Future research could study changes from one attempt to the next and how these changes and the related learnings influence problem-solving outcomes. Third, our data do not inform about the trigger of senior manager involvement. Subsidiary employees may seek help from senior managers. Conversely, senior managers may unilaterally choose to be involved. While our analyses account for multiple drivers of senior manager involvement, future research could explore how motives of senior manager involvement influence problem solving process and outcome. Fourth, we concede that how senior managers are involved can be an important element of problem solving (e.g., type of interaction: emails, phone/video calls, face-to-face meetings, lunches/dinners; frequency and tone of interaction). We encourage scholars to study this element. Finally, we believe our arguments hold in national settings where subunits differ in their requirements and constraints (e.g., multi-business firms), because senior headquarters managers will equally be constrained in their ability to understand the intricacies of all the contexts in which their subunits operate (see Martin & Eisenhardt, 2010). Moreover, fear of evaluation and perceived lack of control

among subsidiary employees resulting from the involvement of senior headquarters managers should also be present in a single country setting. Still, future research could study settings in which senior headquarters managers might be more knowledgeable about some dimensions of the contexts in which their subsidiaries operate (e.g., diversified but domestic multi-business firms, international but related multi-business firms). Along these lines, our results are based on a sample of foreign subsidiaries performing a wide range of value chain activities and monitored quite frequently. Future research could further unpack the effect of corporate structure.

5.5 | Conclusion

We address the issue of the circumstances under which the involvement of senior headquarters managers in problem solving occurring in their subsidiaries enhances (or impedes) solution effectiveness. Our study shows that senior subsidiary managers can guide senior headquarters managers in such a way that their involvement is turned from detrimental to beneficial. Moreover, the involvement of senior headquarters managers is especially damaging when problems have an external locus. Overall, we shed light on factors that drive solution effectiveness for problem solving to deliver on its potential as a key value-creating activity.

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DATA AVAILABILITY STATEMENT

Data have been obtained from the focal firms under confidentiality agreements that restrict data availability to the public.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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