

Who captures value from open innovation — the firm or its employees?

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Abstract. We apply the bargaining power lens on strategic management to analyze the risk related to potential extraction of value by company employees working on open innovation (OI) in the firm. OI exposes individuals to various opportunities, provides a better awareness of the value of their knowledge in other contexts, and makes them more visible externally. OI activity allows access to critical firm knowledge enabling negotiation and engagement with external parties. All of these factors increase the likelihood that these individuals will exit the firm, taking with them valuable proprietary knowledge, while these attractive exit options endow them with significant bargaining power internally. The firm may try to counter this by the imposition of contractual obligations and intellectual property protection using mechanisms which often are only partly effective. This can result in a trade-off between staffing positions related only to OI tasks with individuals that are the best fit from a value creation point of view, thus giving more weight to value capture. We argue that the choices involved in balancing this trade-off will depend on the specific appropriation regime combined with the generality of the knowledge involved. We posit that that in some cases firms may appoint employees with high levels of probity rather than the greatest OI competences.

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Introduction

The strategic management literature distinguishes between value creation and value capture (see, Coff, 1999; Makadok and Coff, 2002). In business practice, open innovation (OI) has become a central strategic tool to enable both value creation and value capture. OI enables firms to access new and valuable resources from external actors, and identify new ways to exploit their resources (Chesbrough, 2003; Laursen and Salter, 2006; Leiponen and Helfat, 2010). Since the publication of Chesbrough's (2003) book, strategy scholars have been investigating the antecedents and design and performance implications of OI for organizations with the aim of increasing our understanding of OI strategy, and firm strategy more in general (Chesbrough and Appleyard, 2007; Whittington, Caillaud, and Yakis-Douglas, 2011; Felin and Zenger, 2014; Hutz, Seidl, and Whittington, 2017).

This body of work has enriched our understanding of how value creation is tied to the organization's relations with a diverse range of external actors, and how the firm's resources can become new sources of value via cooperation with externals. In line with the recent strategic management literature (Leiblein, Reuer, and Zenger, 2018), this work adds also to our knowledge about the interdependencies between adoption of an OI strategy and other managerial choices across the organization (e.g. Foss, Laursen, and Pedersen, 2011; Salter, Criscuolo, and Ter Wal, 2014; Bogers, Foss, and Lyngsie, 2018). The research efforts have been mirrored by industry and the many organizations which are using OI to rethink their innovation activity to try to find new ways to engage with external actors in more collaborative approaches to value creation and capture.

In a seminal paper, David Teece (1986) addressed the critical question of why firms often do not profit substantially from their product innovations and suggested that the reason was related to possession (or not) of complementary assets and the strength of the appropriability regime. In

parallel, although the potential benefits of OI have been recognized, it is understood also that it can introduce appropriation risks for the firm which could jeopardize the value capture from these activities. The literature shows that primary risk is the increased danger of revealing critical knowledge to outsiders which accompanies external engagement. There is a secondary risk which is related to the ability of the firm's employees to generate value from their OI activities to the detriment of their employing firm. While the first issue has received significant attention in the literature (Cassiman and Veugelers, 2002; Laursen and Salter, 2014; Arora, Athreye, and Huang, 2016; Wadhwa, Freitas, and Sarkar, 2017), to our knowledge the second has not been addressed. The present paper is an attempt to redress this.

Individual employees engaged in OI activities are exposed to many value creation opportunities, become more aware of the potential worth of their knowledge in other contexts, and are more visible to the external environment. Also, their OI roles provide increased access to critical internal knowledge used for negotiation and engagement with external parties (Felin and Zenger, 2014). Although it is generally assumed that these aspects benefit the firm, this may not be the case. Engagement in their roles in inbound OI activities provides individual employees with significant bargaining power (Coff, 1999), and potentially allows them to capture value in the form of higher salaries or other job-related monetary benefits from the firm's value generating activities.¹ This concern is reflected in 3M's code of conduct:

Be Loyal: Protect 3M's interests, assets, and information. 3M's reputation and its success are built on the loyalty of its people who put 3M's interests first when doing their jobs; who do not allow personal activities to conflict with 3M's business; and who carefully protect 3M's information, assets, and interests.²

¹ Individuals' roles in outbound open innovation activities could also give rise to increased bargaining power. However, given that the processes are different, to keep the analysis tractable, in this paper, we focus on the inbound aspect.

² 3M's Code of Conduct, https://www.3m.com/3M/en_US/company-us/about-3m/compliance-business-conduct/code/loyal/ accessed Sept 2018.

Ultimately, there is a risk that employees engaged in internal OI activities might exit the firm, taking with them valuable firm-level proprietary knowledge. However, note that the focus here is less on the spillovers resulting from individual employees leaving the organization and more on these individuals' increased bargaining power emanating from the *potential* for their exit on favorable terms. In other words, individual bargaining power is determined largely by the existence of favorable exit options (Coff, 1999).

Therefore, we ask: What are the conditions that allow the firm and its employees engaged in OI, to capture value from this activity? We also investigate what firms can do—under various conditions—to counter the bargaining power of employees engaged in important OI activities. We adopt a bargaining power perspective and suggest that an OI role can increase the employee's bargaining power in the organization. We argue also that it is necessary to consider both the effectiveness of appropriation mechanisms (reflecting the “tightness” of the industry's appropriation regime) for reducing employee bargaining power, and the generality of the knowledge possessed by employees engaged in OI to predict which party will capture value from these activities. We posit that firms attempt to constrain individual bargaining power by imposing contractual limitations and protecting their intellectual property (IP). However, given the incomplete nature of these appropriation mechanisms and drawing on Williamson (1999), we suggest that in some instances, firms may choose to appoint individuals with high levels of probity (reflecting loyalty and rectitude) in preference to the most competent people.

The paper is structured as follows. First, we explore inbound OI employment and how fulfilment of these roles can influence individuals' bargaining power. We examine firms' appropriation mechanisms and organizational practices exploited to lower the risks posed by their employees' engagement in OI activities. We investigate also how appointments of staff to fill OI

roles are shaped jointly by the nature of their knowledge and the appropriation regime characterizing the firm's external environment. This provides a strategic perspective on the micro-foundations of OI, highlighting how organizations must balance the desire to enhance value creation through OI with the need to capture the value from this activity.

Individuals in inbound open innovation roles

Although research on inbound OI focuses primarily on the firm level, there are some individual level studies (West, Vanhaverbeke, and Chesbrough, 2006; Henkel, 2009; Salter *et al.*, 2014; Salter, ter Wal, Criscuolo, and Alexy, 2015; Dahlander, O'Mahony, and Gann, 2016) which investigate the challenges and activities associated to OI. This strand of work explores the activities undertaken by individuals and how their efforts shape their ability to contribute to the firm's value creating activities. How individuals are selected into these roles, and the implications of OI roles for the individuals involved and their subsequent relationships with the firm has been rather overlooked.

Building on the literature on technology gatekeepers and technology scouts (Allen, 1984; Harada, 2003; Rohrbeck, 2010), ter Wal *et al.* (2017) focus on three individual efforts related to the creation of value associated to absorption of external knowledge: identification, assimilation, and utilization.³ First, individuals *identify* technological trends by reading patents, scientific papers, trade journals, and other technical publications, or monitoring developments in the scientific and technical communities. They may engage with developers and suppliers of new technologies such as independent inventors, lead users, vendors, and university researchers. These efforts have been described as technology scouting, and involve active efforts by the firm or individuals to identify possible opportunities for the organization afforded by these new technologies (Rohrbeck, 2010; Monteiro and Birkinshaw, 2017). Second, *assimilation* of external

³ These activities may be undertaken as part of a formal organizational OI job, or within a wider job role.

knowledge (Monteiro and Birkinshaw, 2017; Ter Wal *et al.*, 2017) involves its “preparation” for use by the organization. This might involve the translation or repackaging of external information and technology to make them relevant and useful internally, and in line with the focal firm’s knowledge templates and categories (Lane and Lubatkin, 1998; Ter Wal *et al.*, 2017). *Utilization* of external knowledge might require its championing in internal selection processes and with senior decision-makers, and promoting its use to a potentially hostile audience (Howell and Higgins, 1990). In sum, we posit that all three inbound OI efforts include the possibility for the individual employees involved to acquire substantial bargaining power

Determinants of the bargaining power of individuals in open innovation jobs

The literature examines the activities associated to OI but not the determinants of the individual internal bargaining power engagement in these activities endows (however, see, Simeth and Mohammadi, 2018). High bargaining power can lead to higher financial reward which might affect the value obtained by the firm from the innovation activity. It is clear that individuals involved in OI activity might achieve substantial bargaining power. To understand the influence of human assets on competitive advantage, we draw on Coff’s (1999) determinants of stakeholder bargaining power which are central to our understanding of strategic management. In our case, these determinants include *employees’ access to information*, *firm’s replacement costs if an employee exits*, and *cost of exit to the employee*. The employee’s bargaining power is increased by the first two and decreased by the third. In the case of access to information, employees who control the information might release only enough to achieve their desired outcome (Coff, 1999: 122). We suggest that OI employees inevitably have superior information and knowledge which they can choose to use to their own advantage to leverage their bargaining power. The firm’s replacement costs if an employee exits include the costs of finding a replacement able to perform the same

tasks. The cost of exit to the employee includes the switching costs involved in taking up a new post in another organization. If the individual firm-specific knowledge that is mostly not useful to the new firm, these costs will be high.

Innate determinants due to employee engagement in open innovation activities

As already discussed, their expertise allows individuals engaged in inbound OI activities to possess superior information and knowledge compared to their principals. This asymmetry provides strong employee bargaining power (Prendergast, 2002; Foss and Laursen, 2005). While individuals involved in inbound OI activities often have a strong intrinsic motivation for such engagement activities (Harhoff, Henkel, and von Hippel, 2003), the inherent information and knowledge asymmetry allows for potential self-interest seeking behavior resulting in the ability to extract personal value from the given activity. Their superior knowledge about the OI activity, for instance, relevant external knowledge and its possible match to the firm's internal knowledge (see for instance, Monteiro and Birkinshaw, 2017) implies also, that the firm's management who may not possess the relevant knowledge has to delegate important decisions to the individual agent (Foss *et al.*, 2011). Below, we link Coff's determinants of shareholder bargaining power to the particular roles played by individuals engaged in OI, drawing also on the individual-level OI literature.

Employee's access to information. Engagement in firm inbound OI exposes the individual to a range of external actors. It facilitates personal relationships with numerous outsiders to the focal organization which enriches the focal individual's social capital (Seig, Wallin, and Von Krogh, 2010). By acting as the firm's representative, IO employees can gain access to and engage with actors they would be unlikely to encounter in other job roles. In addition, by acting as a go-between between an external actor and their own organization, they are likely to accumulate a rich

understanding of the needs and orientations of external organizations including who are the key decision-makers and what are their core concerns. In facilitating these links, they may develop an affinity and rapport with these external actors, relationships that might allow the individual access to valuable external resources in the future (Henkel, 2009). This exposure to external firms and their knowledge and technologies could increase the individual's bargaining power in the current firm. In terms of the three types of efforts described above (identification, assimilation and utilization of knowledge), we posit that it is likely that individuals involved in any of these efforts will have a degree of access to the knowledge and experience of the organization, an understanding of the firm's capabilities, needs and legal requirements, and an appreciation of the external environment with respect to sources of innovation.

However, there may be a countervailing mechanism at play. Engaging externally involves the risk that the individual could be perceived as an "outsider" who is more committed to these external partners, communities, and collaborators than to internal colleagues. For instance, Dahlander *et al.* (2016) show that IBM technology scouts with sparse internal networks reaped little advantage from time spent searching externally. This suggests that individuals engaged in inbound OI need to maintain strong ties to internal actors as well as engaging with the external environment. Lack of internal connections could reduce the individual's access to critical inside information which in turn, would limit the individual's bargaining power.

Replacement costs to the firm of employee exit. Inbound OI efforts increase individual alertness to external opportunities (Dahlander *et al.*, 2016). By engaging with people at the technology frontier, these individuals gain access to rare and valuable knowledge about the state of development of new areas. This knowledge allows potentially unique insights into technology and market trends. The study by Dahlander *et al.* (2016) of technology scouts at IBM demonstrates

that individuals benefit from spending some of their time searching externally which allows them to identify new productive technology combinations reflected by higher patenting rates. In a related study, Salter *et al.* (2015) found that R&D scientists and technologists who engage in broad search are more likely than individuals who search more narrowly to be involved in ideation. Thus, a good knowledge of external opportunities combined with in-depth knowledge about the employing firm is know-how that is difficult for an employing firm to replace because it is acquired through experience. The high replacement costs related to an individual with such experience implies high bargaining power for that individual. In terms of the three sets of efforts described earlier, we suggest it will be particularly costly for the firm to replace employees who engage most heavily in the assimilation and/or utilization of knowledge in the context of OI due to the deep knowledge of the focal firm that these efforts demand.

However, there are countervailing mechanisms which potentially could limit this individual bargaining power. Individuals who assume OI roles may be disadvantaged with respect to opportunities within the current organization. Their involvement in OI may isolate them from key decision-makers and the organization's most urgent market and technological problems. The result could be missed opportunities to demonstrate their knowledge and expertise to others inside the organization, and reduced understanding of the firm's current trajectories, choices, and routines. Over time, they may lose the political knowledge and skills to obtain approval for their innovative ideas (Battilana and Casciaro, 2013). The more time and effort expended outside the focal organization, the greater the likelihood that an individual's knowledge base will be more distant from the employing firm's proprietary knowledge (Dahlander *et al.*, 2016). Although industry knowledge may be valuable in the external environment, it is likely less valuable than the firm's unique knowledge in the context of professional advancement in the organization (Campbell, Coff, and

Kryscynski, 2012). Individuals in OI roles may have a better appreciation of the latent opportunities embedded in the firm's capabilities than more locally-focused colleagues, and may become frustrated by inertia or hostility from internal decision-makers to ideas from outside (Antons and Piller, 2015). This "isolation" mechanism might lower the *replacement costs* of individuals engaged in OI.

The cost of exit to the employee. Simeth and Mohammadi (2018) show that a firm-level OI strategy which includes formal research collaborations with a broad set of partners is associated to an increasing rate of employee exit. They suggest that the reason for this is that R&D workers' external options increase if the firm has an OI strategy. In other words, they suggest that formal collaborative linkages to other organizations can be crucial enablers of outward mobility. The empirical evidence in Simeth and Mohammadi (2018) is consistent with our idea that an OI strategy can increase the bargaining power of employees engaged in OI activities. Individuals working on OI are liable to be more visible in the external labor market than colleagues in other roles, and these individuals may have a greater awareness of external opportunities compared to colleagues in other roles. The greater opportunities and attractiveness of exit, implies higher bargaining power for the employee vis-à-vis the employer.

Acting as the firm's representative in interactions with external actors can raise an individual's profile within the industry significantly, and attract the attention of potential future employers. These individuals recognized as possessing particular industry specific knowledge alongside their firms' proprietary knowledge and acquire reputation by representing their organization to key external actors such as suppliers, inventors, universities, and complementors. Their position of authority and their decision-making power in the focal organization signals to external actors that these OI employees are considered by the current organization to be highly

competent and trustworthy. In addition, interaction with external actors can reinforce and validate the individual's assessment of the potential of the knowledge held, and increase the likelihood of their leaving the current firm and exploiting the opportunities provided by this access to external knowledge (Gambardella, Ganco, and Honore, 2015). The increased visibility and increased awareness of external opportunities have the effect of lowering the *exit costs* for individuals working on OI. With respect to the three sets of efforts described above, we suggest that individuals heavily engaged in identifying rather than assimilating and utilizing external knowledge useful for OI will be more able to reduce their exit cost due to their high external visibility.

Nevertheless, the gains from OI workers' increased visibility and increased awareness of external opportunities can be offset by the lower value assigned by external organizations to human capital with OI capabilities. It can be difficult for external employers to assess these capabilities, and potential employers may tend to attribute success in such roles as due to the previous employer's firm-specific capabilities rather than the individual's skill and knowledge (Campbell *et al.*, 2012). This implies high demand side constraints on the assessment of OI skills.

In sum, there are some mechanisms that work to offset some of the gains for individual engagement in inbound OI related jobs. Nevertheless, we posit that individuals who keep up to date with the employing firm's proprietary knowledge and are involved in OI potentially due to the nature of their jobs will be able to challenge the focal firm's ability to appropriate rents from its innovation activities.

Determinants of bargaining power exogenous to the OI role.

There are several factors beyond the determinants related to the characteristics of the job which could affect the bargaining power of individuals engaged in OI activities. In this paper, we focus on the strength of two exogenous factors critical to the bargaining power of the individuals

involved in OI: the appropriation regime, and the specificity/generality of the knowledge. These variables influence individuals' bargaining power by affecting the cost to the employee of their exit. In a "tight" appropriation regime, and/or if the knowledge involved is very specific, the costs of exit to the employee will *ceteris paribus* be high. We focus on these two variables because they allow firms to address the employee appropriation risk strategically, and minimize appropriation of rents by individuals engaged in OI activities (we develop this argument in a later section).

According to Teece (1986: 287) the appropriability regime "refers to the environmental factors, excluding firm and market structure, that govern an innovator's ability to capture the profits generated by an innovation. The most important dimensions of such a regime are the nature of the technology, and the efficacy of legal mechanisms of protection." Here we focus on the notion of appropriation regime. An appropriation regime includes the legal factors that constrain the bargaining power of employees which in turn, allows firms to generate profits from their innovations. The appropriation regime is related not simply to patent effectiveness but also includes use of non-compete clauses, trade secrets, and other legal mechanisms to ensure that employee bargaining power does not prevent the firm from profiting from its innovations. When these mechanisms are effective, the firm can use them to police the behavior of its staff—both during their term of employment by the focal firm and in subsequent economic activities. A tight appropriation context makes it more difficult for the innovating firm's employees to benefit from part of the profit related to the innovation.

Also, the nature of the knowledge involved in OI efforts can be a determinant of employee bargaining power. The type of knowledge involved in the innovation process can be categorized according to the degree of specificity or generality. We follow Arora and Gambardella (1994: 524) and consider information to be "facts" about products, processes, and markets. In this context,

knowledge underpins interpretation of this information. By general knowledge we mean “knowledge that relates the outcome of a particular experiment to the outcomes of other, more ‘distant’ experiments.” (ibid). It follows that knowledge unrelated to other contexts has the highest possible degree of specificity. Knowledge that is highly specific to the organization often is tied to and embedded in its firm-specific routines and practices. This is knowledge related to how the firm works and makes decisions, and the specific technologies and equipment developed by the organization. General knowledge has broad application outside the organization and in a wide range of settings. This general knowledge can be re-used and modified relatively easily by other organizations, and can be useful in other industry settings which increases its value for the individuals involved in OI since they can apply it outside their firm. In the case of highly specific knowledge, the firm’s IO employees will find it harder to obtain a part of the profits from the OI activity.

Managing appropriation risks related to employees involved in inbound open innovation

Appropriation mechanisms for managing the firm’s open-innovation employees

Organizations can use two approaches to manage the appropriation issues described above. The first approach involves using the broader set of legal mechanisms which the firm puts in place to protect it from appropriation by employees. We call this broad set “appropriation mechanisms”. This includes using legal appropriability mechanisms (such as patents) to protect against other firms exploiting their innovations (see for instance, Cohen, Nelson, and Walsh, 2000; James, Leiblein, and Lu, 2013). Appropriation mechanisms include these legal appropriability mechanisms but also ways of tying employees to the organization, and limiting their external opportunities (Liebeskind, 1997). Although the appropriation regime is exogenous and it is determined by the external environment, firms operating within the same external environment

display substantial variation in the degree to which they apply individual appropriation mechanisms (Liebeskind, 1997).

In the case of legal appropriation mechanisms, given the nature of OI, employees will require careful and extensive information on the firm's expectations, and their responsibilities when engaging with external actors. This information could take the form of definition of the types of information that the organization considers is proprietary and should be protected by the firm's employees (Liebeskind, 1997; Henkel, Baldwin, and Shih, 2013). The provision of this information is related in part to the legal requirement to demonstrate active efforts to protect proprietary knowledge which the firm considers constitutes trade secrets. Organizations need to have in place procedures to inform employees about the extent of and protection of their trade secrets, and access to the relevant information (Hannah, 2005). Labor contracts can stipulate personal liability for unauthorized revelation of internal information to external parties. Research shows that individuals often do not appreciate what are considered to be their firms' trade secrets, and demonstrate poor awareness of the legal repercussions described in their labor contracts (Hannah, 2005). Some organizations enforce non-compete contracts for OI staff (Marx, Strumsky, and Fleming, 2009). Ganco, Ziedonis, and Agarwal (2015) found that the enforcement of non-compete conditions on would-be exiting staff limits employee job-hopping. Litigiousness with respect to non-compete conditions helps firms to retain inventors who have developed valuable internal knowledge. However, litigiousness appears relatively ineffective for retaining the most talented staff with more lucrative prospects outside the firm (Ganco *et al.*, 2015). Although not directly enforceable, the inclusion in contracts of such legal mechanisms can affect OI employees' attitudes to exit since they require the individual to "bear the legal and emotional costs of challenging such agreements" (Campbell *et al.*, 2012: 383).

The second approach to limiting these individual risks is to structure the OI activity in such a way that it limits the opportunities for individuals to gain bargaining power. First, it might involve contracts that specify monitoring of communications and exchanges between internal employees and external actors (see for instance, Bercovitz and Tyler, 2014, in the context of university-industry research contracts). In turn, monitoring may involve ensuring participation in external engagements of legal representation or senior staff. In addition, firms can limit the engagement between OI staff and employees in other parts of the organization. Second, firms can limit their employees' ability to engage in unstructured external engagement. For example, many firms operate "no patent, no talk" policies which limit the ability of any of the organization's employees from accepting or soliciting inventions or innovations without prior scrutiny of the intellectual property underpinning these inventions (Salter *et al.*, 2014). Third, formal competitions and other mechanisms to streamline and direct potential external collaborators may allow greater control and purview over the external engagement efforts of its staff (Terwiesch and Ulrich, 2009). These competitions can be structured to enable internal staff to engage with external actors subject to agreements about what information can be provided by each party to the exchange.

Probity as a means for managing the firm's OI-related employees

The above-mentioned mechanisms to manage appropriation risks are effective to a degree but rarely confer perfect protection, and the potential for individual employee's to profit from the organization's OI efforts often remains high. To be an effective OI employee requires an awareness of elements of the firm's proprietary knowledge. It also requires extensive ties to other of the firm's employees to facilitate the transfer and integration of external knowledge (Dahlander *et al.*, 2016).

We suggest that organizations could use staffing decisions related to OI activities as an additional means of capturing the returns from these activities (rather than these returns being

appropriated by employees). Organizations could give priority to staffing OI projects with individuals whose integrity has been demonstrated in their previous work in the firm. In an analysis of when public bureaucracy as a mode of governance might be superior to market or private bureaucracies, Williamson (1999) focuses on “sovereign transactions” and suggests that they threaten probity. He uses the example of foreign affairs and argues further that contracting out of these transactions poses grave difficulties exactly because of probity hazards.

Williamson (1999: 324) states that what “distinguishes ‘probity transactions’ are their needs for loyalty (to the leadership and to the mission) and process integrity. Because breach of contract/lapse of probity can place the system at risk, probity represents a condition of contractual hazard the mitigation of which cannot be realized through pecuniary penalty.” We suggest that private organizations can also face probity transactions such as when the employees involved need to be not only loyal to the focal organization but also able to navigate among external agents following some sort of moral compass. Loyalty is needed to ensure that the employing firm benefits from the transaction, and rectitude is needed to guarantee that the behavior of the employee becomes the basis for trust and repeated interaction with external parties. We argue that OI transactions are often probity transactions because they require loyalty to the focal firm, and morally acceptable behavior (rectitude) when dealing with innovation collaborators.

Research shows that trust is a prerequisite for successful inter-organizational collaboration for innovation (Ahuja, 2000). Indeed, individual employees engaged in OI activities may act opportunistically and potentially not represent the focal firm in a trustworthy manner (thereby decreasing value creation), and can acquire the ability to extract personal rents from the given activity (thereby decreasing the focal firm’s value capture). For these reasons, OI transactions potentially can become probity transactions. Our argument rests on the idea that there is

heterogeneity in the degree to which individual employees within private bureaucracies display probity towards their employing organization. In other words, in our conceptualization, probity is a characteristic of the individual employee.

Previous research shows that tenure and the individual's organizational commitment (reflecting in part a high level of probity) to the employing organization are associated negatively to employee perceptions of firm-specific knowledge, i.e. organizational commitment is not the same as local knowledge (Raffiee and Coff, 2016). Central to our argument is the idea that some individuals are more scrupulous than others, and that more committed individuals are more likely also to exhibit a high level of probity with respect to the focal firm. In this context, note that Raffiee and Coff (2016) found a positive correlation between organizational commitment and tenure. Our assumption is that although it is clear that probity cannot be perfectly observed by the managers of the employing firm, past relational behavior consistent with probity can be observed *ex ante* staffing decisions. We call this "relational probity". Assuming differences in relational probity among individuals, knowledge can be protected by staffing jobs involving the handling of critical knowledge with individuals who in the past have demonstrated probity. This would be an appropriate approach in the case of jobs involving OI-related tasks which require business critical knowledge. However, our arguments imply an important tradeoff: employees displaying high degrees of relational probity may be the best fit from the point of view of appropriation (value capture) but a poor fit from a knowledge (value) creation perspective.

Note that we are not suggesting that OI employees cannot be both loyal and first-class knowledge creators. In many cases employees engaged in OI are intrinsically motivated and scrupulous while also being excellent knowledge creators. However, we would argue there are substantially fewer honorable OI workers compared to the total number of OI employees. Whether

an approach focusing on staffing OI projects with individuals who display relational probity is more appropriate will depend on the contingencies of the particular context.

A simple framework for managing the trade-off between value creation and value capture

We have suggested that the appropriation regime and the specificity/generality of the knowledge are exogenous factors that are critical for the bargaining power of individuals involved in OI. Figure 1 suggests that firms and their employees will appropriate the net benefits from OI depending on the factors conditioning appropriation regime strength and the generality of the knowledge involved in the given activity. Figure 2 depicts optimum staffing of OI roles from the firm's perspective, given the challenges depicted in Figure 1.

First, in a context of a strong appropriation regime and high specificity of knowledge (depicted in Figure 1) we would expect the lion's share of the benefits of OI activity to be retained by the firm since individual knowledge will have little applicability outside the firm, and will be restricted by appropriation mechanisms. However, employees in OI jobs could have some level of bargaining power based on their possession of knowledge that potentially would be valuable for the firm if transferred to the appropriate firm employees. In this case, the OI employee might need some incentive to share his or her knowledge with the relevant firm staff (Foss *et al.*, 2011). Nevertheless, the OI employee's bargaining power will be limited due to lack of attractive exit options. In this case, we expect the firm to choose its best qualified (most expert) employees for the OI task (see Figure 2) since the opportunity to harm the firm will be greatly reduced. The firm will give little consideration to the integrity of these employees since their exit from the firm will be unlikely to have serious negative implications.

[Figure 1, just about here]

In the case of a strong appropriation regime and a high level of knowledge generality as described in Figure 1, we would expect the benefits of the OI effort to be shared between the individual and the firm since the potential for OI employees to reuse this knowledge in other organizations will be high. Effectively, which party benefits from the OI activity will be determined by the parties' respective bargaining power i.e. the balance between the firm's ability to enforce its appropriation mechanisms, and the potential ability of the individual to circumvent these mechanisms and transfer knowledge and experience to other firms for their own gain. Indeed, the risk that employees involved in OI activities will leave the firm and potentially trigger a costly and difficult legal case over ownership of knowledge could increase these individuals' ability to extract benefits in terms of higher pay and promotion in the current employer. This threat (see Figure 2) can be mitigated somewhat by the imposition of appropriation rules which are made more effective by assignment of individuals to OI roles that primarily exploit their specific qualifications and experience.

[Figure 2, just about here]

In the case of a weak appropriation regime and high specificity of knowledge, we would expect the returns to OI to accrue predominantly to the organization rather than the individual (see Figure 1). Although the knowledge might be specific to the firm, the opportunities from exiting the firm might be increased by the IO worker's greater visibility and wider social network deriving from his or her OI activities, which will increase individual bargaining power. If the firm is unable to enforce its appropriation mechanisms, these individuals might make some limited profit from potentially taking alternative employment outside the organization. If the IO worker's knowledge is specific, then his or her bargaining power will be relatively low due to its limited applicability

in other firms. In this case (see Figure 2) we expect the firm to choose staff with highly specialized knowledge.

The final case involves firms operating in a weak appropriation regime and a context characterized by very general knowledge. In our setting, this is the most risky and potentially most dangerous for the organization since the benefits of external engagement are liable to accrue to the individuals involved in OI jobs rather than to the organization (see Figure 1). As suggested by Figure 2, firms should assign staff based on their relational probity in the context of their organization rather than their OI competence. Loyal employees with a high level of integrity are likely to have tenure based on the value of these characteristics to the firm, and therefore, will be less likely to exit. They may not be best suited to involvement in external engagement but will be less likely to try to profit from these external relationships.

Conclusions

So far, the OI literature in strategic management has focused largely on the benefits and costs of inbound OI in the context of value creation and does not investigate the risks related to individual-level strategic behaviors with respect to value capture. In particular, although some previous work highlights the dangers of appropriation arising from OI at the firm and project levels, little attention is paid to the specific risks related to the firms' employees and their potential for capturing personal value from their OI activities. We used a bargaining power lens to argue that individuals working in OI jobs gain significant bargaining advantage from their higher visibility, greater knowledge, and richer social capital compared to more internally facing colleagues. They have access to critical business knowledge, and acquire detailed insights into the firm's strategy and objectives. In addition, their interactions with internal and external actors in the course of their OI jobs can validate and reinforce their perception of the underlying value of this knowledge. As a result, these

individuals are well placed to capture personal value from OI via the extraction of higher compensation to persuade them not to leave and join another firm.

To counteract the bargaining power accruing to individuals in OI roles, we suggested that firms must be proactive and establish appropriation mechanisms. However, ultimately such these measures are likely to be only partially effective. By investigating these issues, we have tried to highlight situations where the firm and its employees share the rewards associated to OI. Our analysis suggests that concerns over the nature of the knowledge and the OI appropriation regimes shape both the types of individuals assigned to these roles and the resulting benefits and costs. In particular, we suggested that if the knowledge associated to OI has a high level of generality and appropriation mechanisms are weak, the firm will choose to appoint its most loyal and moral staff rather than the most competent individuals.

Leiblein et al. (2018: 559) propose “that the field of strategy [should] be defined by and unified around the study of strategic decisions—decisions that are interdependent with other decisions and therefore have the potential to guide other decisions”. From this perspective, adoption of an OI strategy is indeed a strategic decision which not only involves important trade-offs but also affects a host of other important choices which taken together, determine value creation and capture. For instance, the previous literature shows that an OI strategy has a major effect on decisions about appropriability modes. In this paper, we examined how adoption of an OI strategy affects choices related to the selection of individuals into OI roles taking account of both value creation and capture motives.

We hope that our work will help shift research attention toward the micro-foundations of strategic choices with respect to OI. First, the firm-level literature on inbound OI tends not to consider the distribution of the benefits from the value creation associated to an open strategy

between the organization and its employees; however, this is a critical question for strategy. It is interesting that Chesbrough's (2003) original formulation of OI discusses the danger of exiting staff as a major "erosion factor" related to the need for firms to shift from closed innovation to OI. However, few studies have built on this important insight. The prevailing assumption has been that OI is a vehicle for value creation at the organizational rather than the individual level, and that altruistic and proactive employees will be willing and able to deliver these benefits for the organization. This paper can be seen as a call for a return to a "sober" view of the value of OI by highlighting the dangers to the firm from the use of OI knowledge by its own staff. It is important to pay attention to the design of contracts for OI employees, an issue that has received far less attention than the case of design of contracts pertaining to inventors. We pointed out also that even although the net benefits of adopting an OI strategy might be positive and result in potentially high payoffs, it would be ironic if a shift to OI motivated in part by fear of losing staff, increased staff departures. Ultimately, differences in how well firms are able to manage their OI employees may give rise to variations in these firms' ability create and capture value from these activities. We have suggested that both legal and organizational measures are relevant—staffing decisions at the firm-level could have a major influence on value creation and value capture. Future research should specify and test these relationships empirically.

Second, future research could investigate the characteristics of individuals involved in OI by examining selection into OI jobs in preference to more conventional careers. Initial evidence is provided by Vanhaverbeke *et al.* (2017) who use LinkedIn data for individuals with job titles that include the term OI. Their study shows that OI employees stay with the same firm for longer and tend to have longer tenure in their organization which is consistent with our idea that (relational) probity might affect appointments to OI jobs. However, it raises the question of whether individual

OI employees are likely to have increased bargaining power via exit. To explore this tension, future work could examine the “slotting in” and assignment of individuals into OI roles in the organizations (Keller, 2018) and the mobility of OI employees within the wider economic system. Particular attention should be placed on the motivations of individuals choosing a career in OI, and the selection criteria and logic applied by the organization in recruiting for OI jobs. This would allow assessment and testing of how much probity considerations shape managers’ appointment choices. Although probity is difficult to measure or assess, it is likely that organizations have some level of knowledge of employees’ loyalty based on experience. It would be useful to know whether loyalty is rated more highly than rectitude in firms’ decisions, and how these two aspects of probity are aligned (or not) to the competencies of the individuals involved.

Third, it would be useful also to assess the performance implications for individuals who take OI jobs. We have suggested that engagement in inbound OI is likely to result in a wage premium. We conjectured also that in a tight appropriation regime, a wage premium for OI employees will be less likely, and that if the knowledge is firm-specific, OI employees will be less likely to profit from their role. However, these conjectures require empirical corroboration. It would be informative to explore empirically whether different OI roles generate greater opportunities for wage gains (and/or employee exit). It is possible that individuals in OI roles may expropriate rents differentially, depending on their knowledge identification, assimilation, or utilization capabilities as discussed earlier in this paper. We could speculate that since individuals focused on knowledge identification are the most visible to the external actors this might be accompanied by stronger bargaining power, and that those focused on utilizing knowledge will be less visible. In this latter case, the knowledge is more firm-specific, making it a relatively poorer basis for bargaining power. Between these two are OI employees involved in knowledge

assimilation. These ideas could be examined by developing like-for-like comparisons of those individuals in OI roles with others in more conventional innovation jobs, possibly based on a combination of surveys, employer-employee datasets, career history data, and variations in the external environment across locations, sectors and types of knowledge.

Fourth, we have mostly overlooked “pull factors” in the external environment which might shape the balance of the bargaining power between individuals and organizations in the context of OI. It could be expected that in rapidly-emerging domains and contexts that attract large amounts of venture funding, individuals in OI roles would have better access compared to other domains to both the means and opportunity to exploit external prospects (Chesbrough, 2003), and that this would engender greater risks for the firm and further increase its employees’ bargaining power.

We hope that this essay will encourage more work on who captures value from OI—employees or the organization—and how organizations try to protect themselves from the behavior of their employees. We hope that this paper will help to spur progress in this exciting research agenda.

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		Specificity of the knowledge involved	
		High specificity	High generality
Strength of appropriation regime	Strong	Returns to the firm	Returns shared between employees and firm based on bargaining power
	Weak	Returns largely to the firm, but potential for individuals to profit	Returns to employees and potentially external organizations

Figure 1: Who benefits of open innovation efforts?

		Specificity of the knowledge involved	
		High specificity	High generality
Strength of appropriation regime	Strong	Staff with whoever is best qualified for the task	Staff with whoever is best qualified for the task, but rely on contracts to minimize appropriability concerns.
	Weak	Staff with knowledge specialists to minimize appropriability concerns	Staff with employees displaying probity to minimize appropriability concerns

Figure 2: How to address expropriation risks regarding Open Innovation projects involving business critical knowledge.