

The Inside Track: Entrepreneurs' Corporate Experience and Startups' Access to Incumbent Partners' Resources

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Abstract: Startups are increasingly turning to incumbent firms for venture capital, anticipating access to the investor's knowledge and complementary assets. However, startups' eventual access to these resources varies widely. This paper highlights one important driver of such variance, whether startups' managers were previously employed by an incumbent in the same industry. Using data from the life-sciences, I find that such corporate experience can precipitate technical knowledge flows to startups by enabling the generation of relational capital with incumbent firm managers. It also helps startups navigate incumbents' decision-processes to formalize access to downstream complementary assets via alliances. The former effect is stronger when corporate experience is technology-focused, the latter when it is commercialization-focused. Corporate experience at the investing incumbent firm amplifies informal knowledge-flows but not formal alliances.

Managerial Summary: Startups typically expect corporate venture capital investors to facilitate access to resources these investors' parent companies control. However, such resource-access often does not materialize, with startups struggling to navigate the large, complex organizations within which these resources are located. I identify an important driver of variance in such resource-access. Prior experience working in an established company in the same industry enhances startup leaders' ability to informally tap into corporate investors' technical knowledge, and to formalize alliances to access corporate investors' go-to-market assets. Technology-focused experience is especially helpful with the former, and commercialization-focused experience with the latter. Such access is more likely to enable exit for the startup if the established firm has direct experience in the specific product markets the startup is focusing on.

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Technology scholars have long perceived a natural affinity between entrepreneurship and innovation (Chatterji, Glaeser, and Kerr, 2014; Schumpeter, 1934). Entrepreneurial firms' propensity to drive change makes them attractive partners for larger, more established organizations for whom these relationships can serve as a window into emerging technologies and business models (Basu, Wadhwa, and Kotha, 2016; Dushnitsky, 2012). Corporate Venture Capital (CVC), the practice of established firms making minority equity investments in startups, is a product of this imperative. The practice has grown prodigiously in recent times, and established firms now represent a significant part of the entrepreneurial funding ecosystem globally (Dushnitsky and Yu, 2022).

For startups, these relationships with established firms can be of value as a channel for access to important resources (Basu, Phelps, and Kotha, 2011; Katila, Rosenberger, and Eisenhardt, 2008). Research has, however, documented substantial heterogeneity in whether this benefit is realized in practice (Alvarez-Garrido and Dushnitsky, 2016; Jeon and Maula, 2022; Pahnke, Katila, and Eisenhardt, 2015). While there is broad agreement that established firms control resources that could be of value to startups, an important debate in this literature has centered on whether the startups can, in practice, access these resources via these relationships. The primary impediment to resource access for startups relates to navigating the organizations within which these resources are embedded. The established firms in these relationships are typically large organizations with complex hierarchies and decision processes. For startups, identifying the location of the resources most useful to them within these firms and finding an effective way to leverage them are far from trivial tasks. As Pahnke *et al.* (2015: 9) conclude, "Helpful resources exist within corporations, but dispersed authority, complex and slow organizational processes, and internal conflicts... complicate ventures' access to these resources".

However, research has thus far not considered the possibility that entrepreneurs may differ systematically in how effectively they are able to deal with these challenges. The backgrounds and experiences of these individuals may leave their startups differentially equipped to navigate these relationships and thus to obtain access to the valuable resources controlled by the established firm. Broader work on entrepreneurial origins has demonstrated

that the careers led by entrepreneurs prior to launching their ventures can importantly influence their subsequent decisions and outcomes (Agarwal *et al.*, 2004; Beckman, 2006; Chatterji, 2009). In particular, this research identifies prior experience working at an established firm in the same industry, i.e., *corporate experience*, as an important differentiator in shaping startups' outcomes. In this paper, I examine the role that corporate experience plays in the context of the relationships between startups and established firms arising from CVC investments.

I theorize that corporate experience should enhance startups' access to two key types of resources controlled by established firms: (i) technical knowledge, i.e., expertise on technological invention and refinement (Henderson and Cockburn, 1994; Hess and Rothaermel, 2011), and (ii) downstream complementary assets relating to product development and commercialization (Åstebro and Serrano, 2015; Teece, 1986). Experience working in a similar environment is likely to provide entrepreneurs with greater shared experience with the managers in these organizations, which research has shown to be an important source of the empathy that fuels relationship formation (Ingram and Morris, 2007; Lazarsfeld and Merton, 1954). Such relational capital is likely to be key to precipitating the sharing of technical knowledge, given that the employees in established firms who possess technical expertise are not formally incentivized to engage with the startups (Smith-Doerr and Powell, 2010). In contrast, access to downstream complementary assets (such as physical assets, data libraries, or IP) must typically be enabled via more formalized processes, which are subject to obstruction by a variety of stakeholders within the established firm (Pahnke *et al.*, 2015). Having prior experience of working in a similar environment should also give entrepreneurs a better understanding of the decision processes that characterize these firms, as well as the incentive structures governing their managers' behavior (Cohen and Bacdayan, 1994; Zahra, Neubaum, and Hayton, 2020). These entrepreneurs are, therefore, better equipped to understand the origins of any barriers they encounter within the incumbent firm to accessing complementary assets that would be valuable to their startups.

I probe the mechanisms underlying these hypothesized relationships by considering how different types of corporate experience may alter them. Prior experience working at the

specific established firm that is the focal corporate investor (as opposed to another established firm in the industry) should strengthen each of these baseline relationships by providing the entrepreneurs with firm-specific knowledge that should enhance their ability to build relationships within the corporate investor and to navigate its decision processes. Additionally, control over the two types of key resources typically lies in different parts of the established firm. Hence, experience in the relevant parts of such firms should correspond to the entrepreneur having an enhanced ability to access that type of resource. Specifically, I expect having technology-focused corporate experience (e.g., in R&D) should have a more pronounced effect on startups' access to technical knowledge than market-focused corporate experience (e.g., in sales), whereas the opposite should be true in relation to downstream complementary assets.

I test these predictions in the context of the relationships between startups in the life sciences and their corporate investors, typically large pharmaceutical companies. A significant challenge to doing so empirically is that corporate experience is not randomly assigned i.e., startups whose managers have corporate experience may be distinct from ones that do not in various observable and unobservable ways. To account for this, I restrict comparisons to be within groups of startups matched on observables and within the portfolio of investments made by a particular established firm. I also draw on plausibly exogenous variation in whether startups have managers with corporate experience based on two localized drivers of the personal risk associated with leaving a job at an incumbent firm to work for a startup – the strength of enforcement of employee non-compete agreements and the unemployment rate in the area. Using these as instruments, I find that having managers with prior experience working at an established firm in the same industry is associated with higher levels of post-investment citations of the established firm's patents by the startup, as well as with a greater likelihood of downstream alliances being formed between the firms to develop and commercialize the startup's technology. These results correspond to startups with corporate experience having greater access to the technical knowledge and downstream complementary assets of their corporate investor.

While startups' ability to build informal relationships that facilitate access to technical knowledge is substantially strengthened when the corporate experience is at the focal established firm making the CVC investment, I do not observe an equivalent effect in relation to the more formalized process of downstream alliance formation. In line with my theory, I also find that technology-focused corporate experience has a stronger relationship with access to technical knowledge than commercialization-focused corporate experience, whereas the opposite is true in relation to downstream complementary assets.

In additional analyses, I also find that corporate experience is associated with a greater likelihood of a subsequent liquidity event (i.e., exit) for the startup when its technology is targeting a therapeutic area in which its corporate investor has direct experience. This would indicate that the enhanced access corporate experience enables for the startup is most valuable from the perspective of exit when the established firm has expertise salient to the specific application areas to which the startup is targeting its technology.

In combination, these findings contribute to the literature examining the value of corporate venture capital based relationships with incumbent firms for startups. Corporate VC now represents a major part of the startup funding ecosystem. Understanding the impact of these relationships on the outcomes of entrepreneurial firms is therefore critical (Kim and Park, 2017; Paik and Woo, 2017; Polidoro and Yang, 2021). Research has documented heterogeneity in the resource access that accrues to startups via these relationships (Alvarez-Garrido and Dushnitsky, 2016; Pahnke *et al.*, 2015). This study advances that conversation by identifying an important driver of that heterogeneity: the prior experience of entrepreneurs. The findings demonstrate that such experience can enhance startups' access to two critical types of resources, technical knowledge and downstream complementary assets, and highlight the mechanisms underlying this access.

The study also contributes to the literature on entrepreneurs' antecedents and their impact on startup firms' outcomes. Findings in this domain that prior experience working at an established firm is beneficial to entrepreneurial performance have been accompanied by calls to examine the mechanisms underlying these benefits (Chatterji, 2009; Shah, Agarwal, and Echambadi, 2019). This study documents the role such experience can play in enabling

startups to navigate external partnerships, which can often be critical to these firms' outcomes (Katila *et al.*, 2021). More broadly, the findings highlight the importance of intra-firm factors in shaping the exchanges and outcomes arising in inter-firm relationships, which have received limited attention in prior work (Balachandran and Eklund, 2023).

THEORY

Entrepreneurial firms are often advantageously situated to be the drivers of industrial change. Unencumbered by attachments to structures that conform to the established order, they are freer to pursue novel technologies and business models (Schumpeter, 1934). However, entrepreneurial ventures are typically also resource constrained, lacking the independent wherewithal to establish themselves in competitive markets. Accessing the resources needed to do so often means partnering with larger, more established firms (Gans and Stern, 2000; Katila *et al.*, 2021). Such partnerships between established and entrepreneurial firms have been of considerable scholarly interest given their potential to influence the direction of technological innovation.

Corporate Venture Capital refers to minority equity investments in startups by established firms. For the latter, relationships with startups arising from CVC investments are principally intended to provide a window through which emerging technologies can be observed and understood (Basu *et al.*, 2016; Dushnitsky and Lenox, 2006). For startups, the principal source of value from these relationships is access to valuable resources controlled by the established firm, in particular to knowledge and complementary assets that would be difficult to obtain by other means (Dushnitsky and Yu, 2022). Research shows that startups are more likely to seek investment from established firms with stronger technological and marketing resources (Basu *et al.*, 2011). Obtaining investment from a large incumbent firm in the industry may in some instances also be seen as a valuable endorsement that sends a signal of the startup's quality to other stakeholders (Stuart, Hoang, and Hybels, 1999). Research also highlights some risks for startups associated with these relationships. The larger, more powerful established firms may misappropriate startups' intellectual property (Dushnitsky and Shaver, 2009; Katila *et al.*, 2008). Alternatively, they may push startups to make choices

that favor their interests, but that may be sub-optimal from the startup's perspective (Masulis and Nahata, 2009).

Given the range of theorized costs and benefits, an active stream of research has been focused on understanding whether and how startups' innovation efforts benefit in practice from having a corporate investor. Alvarez-Garrido and Dushnitsky (2016) compare the effect of CVC investors to conventional VCs on entrepreneurial firms' rate of innovation. They find that the effect of having CVC investment on the rate of innovation of startups is positive on average and substantially stronger if the startup's access to the established firm is enhanced by being collocated with it. Kim and Park (2017) similarly report a positive relationship between CVC investment and the rate of patenting, though only if the startup receives CVC investment in the first three years of its life. On the other hand, Pahnke *et al.* (2015) find that the effect of having a CVC investor on the rate at which entrepreneurial firms innovate is either insignificant or negative. In explaining their results, these authors suggest that organizational complexity and internal conflicts within the established firm may be limiting startups' access to the resources that exist within these firms.

The common driver of variance identified across these studies in the value startups derive from these relationships is *access*. While the established firms that make these investments possess a range of potentially valuable resources, these resources are typically embedded within labyrinthine organizations, and their access is controlled via convoluted decision processes that startups can often struggle to navigate (Jeon and Maula, 2022). A question that follows naturally from this is whether some startups are better equipped to overcome these impediments to resource access than others, and what characteristics of startups may be associated with an enhanced ability to do so. There has thus far been little research into this question, which is increasingly important given the preponderance of these types of relationships. I will address this gap by focusing on the antecedents of the individuals running these startups and considering whether their prior careers may differentially equip them to navigate these relationships with incumbents.

Corporate Experience and Entrepreneurship

Though popular notions of entrepreneurship conceive of founders as college dropouts working out of a garage, in reality most entrepreneurs have prior employment experience, and this experience significantly shapes their approach toward entrepreneurship (Beckman, 2006; Bhide, 1994; Robinson and Sexton, 1994). There is some evidence to suggest that a common path to entrepreneurship in high-technology industries involves prior employment at an established firm (Freeman, 1986; Gompers, Lerner, and Scharfstein, 2005). This is sometimes referred to as “spawning,” which Chatterji (2009: 186) describes as “the process by which employees of incumbent firms found entrepreneurial ventures in the same industry”.

Gompers *et al.* (2005) outline two possible processes of entrepreneurial spawning from incumbent firms. In the first, employees of incumbent firms in an industry gain a range of skills and knowledge through their work that they can fruitfully employ in dealing with the challenges of entrepreneurship. They may also gain access to networks that include suppliers of labor, goods, and capital, as well as potential customers. These resources facilitate the launch and growth of their ventures. In the alternative process, employees of incumbent firms become entrepreneurs because the large bureaucratic organizations fail to facilitate the development of their entrepreneurial ideas internally (Cassiman and Ueda, 2006).

A range of studies have also suggested that the performance of firms founded by former employees of incumbent firms will be superior to that of other types of entrepreneurial firms (Agarwal *et al.*, 2004; Klepper and Sleeper, 2005). They suggest that this superior performance is explained by inherited capabilities in relation to technology, market, and managerial processes (Basu *et al.*, 2015). For instance, Chatterji (2009) found that spawns are likely to raise funding more quickly and that they receive higher valuations in their last rounds of funding than firms founded by individuals with no prior work experience at established firms. However, he finds no evidence that the advantages enjoyed by spawns are the result of technical knowledge inherited from incumbent firms. Instead, he suggests that these benefits arise because of more tacit non-technical knowledge such as an understanding of regulatory and marketing processes in the industry.

While prior research examining entrepreneurs' backgrounds offers us various hints that this is likely to influence the way these individuals manage their startups' relationships with other organizations, there is little work explicitly examining this issue. This is important given the often critical role of external relationships in fostering the success of entrepreneurial ventures (e.g., Katila *et al.*, 2021; Stuart, Hoang, and Hybels, 1999). In this study, I will consider specifically how entrepreneurs' prior experience working at an established firm may influence the extent to which their startups are able to access valuable resources via their relationships with corporate investors.

Key Sources of Value: Knowledge and Complementary Assets

While there are a range of channels by which startups could potentially generate value from their partnerships with incumbents, my focus in this paper will be on their access to the two types of resources highlighted in the literature as being of prime importance – technical knowledge, and downstream complementary assets (Basu *et al.*, 2011; Dushnitsky, 2012; Katila *et al.*, 2008). While the empirical analysis in this study is quantitative, I also carried out a number of interviews with managers of startups in the life sciences, as well as from CVC divisions of incumbent pharmaceutical firms to develop an understanding of the mechanisms that operate in this setting. I will draw on information gained from these interviews to help illustrate my theoretical arguments.

Access to the Established Firm's Technical Knowledge

Established firms in technology-intensive industries typically possess sizable reserves of technical expertise. Their employees, such as R&D scientists, developers, or engineers, embody a deep knowledge of and experience with technological invention and development (Henderson and Cockburn, 1994; Hess and Rothaermel, 2011). Such technological expertise can be critical to startups, whose efforts at the early stages are often focused on refining a promising basic technology or adapting technology to a novel application (Shane and Stuart, 2002). The expertise startups need to make progress is often wide-ranging, covering not just a deep knowledge of the underlying basic technology itself but also its interaction with other technologies it may be used in conjunction with, designing a method of delivery/application,

developing processes of synthesis, improving efficacy, and ensuring safety (Cassiman and Ueda, 2006; Dessain and Fishman, 2017; Thompson, 2005).

Given the resource constraints startups typically operate under, they are unlikely to possess the full range of technical expertise needed within the company, and it can be costly for them to access via direct hiring or contracting (Burton, Dahl, and Sorenson, 2018; Dahl and Klepper, 2015). A key source of potential value for startups from having an established firm as a VC investor is that it could serve as a repository for some of this much-needed expertise (Iansiti and West, 1999). In my interviews, a number of startup founders

highlighted the role of their corporate investors in helping them solve technical challenges -

“Corporates tend to give you contacts in the science, (an) area of drug discovery you have a particular challenge in. Most likely within their own organization.”

“<The corporate investor> was terrific when helping me with technical problems. I thought that was tremendously helpful, providing access to people with knowledge and expertise... Access to people who had expertise we didn't have.”

Others also highlighted the value of the scale of the R&D organization the corporates possessed and the value of leveraging that expertise.

“Access to a very deep organization... They are attached to an enormous R&D infrastructure which you can tap into... access to intellectual scale that traditional VCs do not have as much of.”

However, startups also face some impediments to leveraging this knowledge via these relationships. The established firms engaged in corporate VC are typically large organizations with the expertise relevant to the startup spread out over various divisions, functions, and geographies within these organizations (Aggarwal, Hsu, and Wu, 2020; Almeida and Phene, 2004). For a startup, identifying where in the established firm the valuable knowledge is located and establishing a connection to those parts of the firm can be difficult (Hansen, 1999; Sackmann, 1992; Singh, Hansen, and Podolny, 2010).

Effectively accessing that expertise once it is located can also be challenging. On the established firm side, these investments are typically led by the managers in the corporate VC division (Basu *et al.*, 2016). These individuals are typically the only employees within the firm whose principal responsibilities relate to the startups receiving CVC investment from it (Lerner, 2013). However, the technical expertise that would be valuable to the startup is generally located in other parts of the established firm, for instance, within the R&D

organization or in different business units. The employees within these other divisions, in contrast to the CVC managers, rarely have financial incentives tied to the firm's corporate VC activities; hence, their formal imperative to engage with startups or to find ways to provide them with expertise is typically weak.

Yet, as a wide range of studies have emphasized, informal mechanisms can serve as a lubricant to facilitate economic exchange in interfirm relationships, especially when formal incentives are weak (Gulati and Gargiulo, 1999; Smith-Doerr and Powell, 2010). As Kale, Singh, and Perlmutter (2000: 217) highlight, "Relational capital based on mutual trust and interaction at the individual level between alliance partners creates a basis for learning and know-how transfer across the exchange interface". Many of the entrepreneurs I interviewed highlighted that access to the established firm's knowledge was not a given, and that it depended on the quality of the relationships they built with the relevant individuals in the larger firm. For instance, one founder said –

"You needed to cultivate it (access)... I spent a lot of time cultivating relationships within <established firm>, so that I did have people that I could access and talk to and that could be helpful."

Building this type of relational capital within the established organization is likely to provide the startup insight into what types of technical resources are located where. Furthermore, the existence of these relationships may, on the margins, persuade the individuals who possess this expertise to dedicate some time to helping the startups (Perrone, Zaheer, and McEvily, 2003). The formal incentives for them to do so being weak, the marginal effects of these informal relationships become particularly significant. The importance of the entrepreneurs being able to build these relationships in the incumbent firm for themselves was also highlighted by the established firm CVC managers I interviewed, with one of them articulating this as,

"I tend to make an introduction and move out. I will let them find their way around... because I don't want to be chaperoning each of my companies daily and I don't want to be in each of these conversations... If they want some R&D advice I usually make one connection... They need to put some effort to see if there is some convergence of views and help... sometimes it happens and sometimes it doesn't."

I argue that entrepreneurs with corporate experience would be better able to develop and grow these relationships with the relevant managers in the established firm who possess

the technical knowledge that could be valuable to them. Homophily implies that similarity between people tends to promote contact between them, and the principle has been demonstrated to be pervasive to relationship formation across a multitude of settings (McPherson, Smith-Lovin, and Cook, 2001; Pfeffer, Salancik, and Leblebici, 1976). Established firms in an industry often share cultural and structural similarities (DiMaggio and Powell, 1983; Glynn and Abzug, 2002). The knowledge gained from working in similar settings should provide an entrepreneur with greater shared experience with the relevant managers in the established firm, which research has shown to be an important source of the empathy that fuels relationship formation (Ingram and Morris, 2007; Lazarsfeld and Merton, 1954). As one entrepreneur told me,

“It helps that we have some of the same cultural reference points... Like I might say, don’t you hate it when such and such happens, and they know exactly what I’m talking about... It creates a connection, you know, we can relate to each other”

Contrast this with an entrepreneur whose career experiences have been limited to academia, startups, or venture capital, all common backgrounds in technology-intensive fields (Roche, 2022; Shah and Pahnke, 2014). All else being equal, the latter individuals are likely to be less well equipped to develop relational capital within the established firm, which can limit their ability to locate and access technical knowledge within these firms.

Hypothesis 1: Startups whose entrepreneurs have experience working at an established firm are more likely to obtain access to their corporate investors’ technical knowledge.

Access to the Established Firm’s Downstream Complementary Assets

Effective innovation demands both the technical knowledge core to invention as well as the complementary assets required to translate that invention into a commercial product or application (Teece, 1986). These could include physical assets such as laboratories or factories; relationships with suppliers, customers, or regulators; intellectual property such as licenses on production or delivery mechanisms, etc. Access to these complementary assets can represent substantial barriers for startups (Åstebro and Serrano, 2015; Iansiti and West, 1999). As prior research has documented, partnering with incumbents is a crucial channel by which startups can access them (Gans and Stern, 2000; Rothaermel, 2001).

However, as with technical knowledge, startups typically also face some significant impediments to being able to access the downstream complementary assets possessed by their corporate investors. Given the typically more corporeal nature of these assets, accessing them often requires a more formalized process of approval, which necessitates engagement with the bureaucratic machinery of the incumbent firm. The decision-making process within the incumbent firm to generate such approval is often complicated by the presence of multiple stakeholders with varying incentives, each with the ability to block or impede the startup's access to these resources. This is the "dispersed authority, complex and slow organizational processes, and internal conflicts" highlighted in prior work by Pahnke *et al.* (2015: 604), which can restrict startups' access. This issue also came up often in my interviews with entrepreneurs. One startup founder articulated this as follows-

"Partly because of the layers of organization that they have and the kind of centralized management which means that they can't get out of their own way... and there is always somebody that is going to suggest something... Its extraordinary, the level to which you have to jump through hoops to get things done..."

Another entrepreneur describing their struggles with accessing some of their corporate investor's infrastructure lamented that there was *"always somebody to say no."*

Corporate experience is likely to aid startups' efforts to overcome these challenges. Entrepreneurs who were previously employed by established firms in the same industry typically have a better understanding of the decision processes that characterize these firms and the incentive structures under which their managers operate compared to entrepreneurs lacking this type of experience (Beckman, 2006). One entrepreneur, describing to me how their corporate experience helped in this regard said,

"The red tape I could handle. I spent 20 years at <large pharmaceutical firm> dealing with the same sort of red tape so I knew ways of getting around that."

Working in established firms also lends to these individuals a familiarity with the norms and value perceptions prevailing within them, which are likely to be substantially similar across the industry (Chatterji, 2009). Entrepreneurs with corporate experience are more likely to have an understanding of whose opinions are likely to be critical in determining whether they are given access to a particular resource and the incentives that those individuals are responding to (Marquis and Tilcsik, 2013). These individuals are, therefore, better equipped

to understand the origins of any barriers they encounter within the established firm to accessing complementary assets that would be valuable to their startups. Their understanding of the organizational context can help them comprehend the identity of the key stakeholders in relation to the focal decision relating to access, and their concerns. This should, in turn, help them build coalitions within this organization that can, on average, help move decisions regarding access in their favor compared to entrepreneurs who lack this type of experience.

Hypothesis 2: Startups whose entrepreneurs have experience working at an established firm are more likely to obtain access to their corporate investors' downstream complementary assets.

Prior Experience at the Investing Firm

Thus far, I have focused on generalized corporate experience, i.e., experience working at an established firm within the same industry, which prior work has identified as a significant driver of variance in startups' choices and outcomes (Agarwal *et al.*, 2004; Chatterji, 2009). However, in the context of corporate VC relationships, a special case of such experience that merits attention is when that experience is accumulated at the specific established firm that is making the focal CVC investment, i.e., prior experience working at the same established firm that is the corporate investor. The knowledge, skills and mental models that employees develop over time can acquire some specificity to the organization they work for (Becker 1964). Such firm-specific human capital can include technical skills and capabilities, but it also includes an understanding of the routines and practices that characterize the organization as well as the norms of behavior that operate within it (Coff, 1997; Wang, He, and Mahoney, 2009). Research has shown that the movement of employees who possess this type of firm-specific human capital can lead to the transfer of resources and information between firms, both via the knowledge these employees carry directly as well as the sharing that arises after they have moved (Agarwal *et al.*, 2004; Mawdsley and Somaya, 2018). Research also suggests that the rate of knowledge sharing via other channels such as alliances is enhanced if there are employees who have moved between the partnering firms (e.g., Singh and Agrawal, 2011; Wagner and Goossen, 2018).

The theorized mechanisms underlying the value of corporate experience in the context of Corporate VC relationships are (a) an enhanced ability to build informal relationships within the established firm which can precipitate knowledge sharing, and (b) an understanding of the processes and norms of decision making that facilitates formal access to downstream complementary assets. Possessing firm-specific human capital originating in the focal corporate investor itself rather than another established firm in the same industry should strengthen each of these effects. Firm-specific experience localized to the focal corporate investor should facilitate greater shared experience with the scientific or technological personnel who are the repositories of technical expertise the startups would benefit from (Kim, Oh, and Swaminathan, 2006; Marquis and Tilcsik, 2013). Similarly, firm-specific human capital developed at the focal investing firm should strengthen the entrepreneurs' ability to navigate the decision processes within this firm (Higgins, 2005; Mizruchi and Stearns, 2001). This should enhance their ability to generate the formal approvals associated with access to its downstream complementary assets, compared to entrepreneurs whose experience is at other incumbent firms in the industry. Hence,

Hypothesis 3a: The relationship between startups' corporate experience and their access to their corporate investors' technical knowledge will be stronger when this experience is in the focal investor's parent than when it is in other established firms.

Hypothesis 3b: The relationship between startups' corporate experience and their access to their corporate investors' downstream complementary assets will be stronger when this experience is in the focal investor's parent than when it is in other established firms.

Heterogeneity in the Nature of Corporate Experience

While corporate experience should, on average, help startups access both technical knowledge and downstream complementary assets, control over these two types of resources typically lies in different parts of the established firm. The technical knowledge that would be valuable to a startup is located in the parts of the established firm that are technology-focused, such as R&D, engineering, or product development. On the contrary, control over downstream complementary assets is likely to be housed in the more commercially oriented parts of the organization. These different parts of established firms often vary in the norms

that characterize the behavior of the individuals within them, as well as the processes by which they make decisions (Almeida and Phene, 2004; Burgelman, 1991).

Scientists and technologists are, to a greater degree, members of knowledge communities that go beyond their firm's boundaries. They often publish research in academic journals and attend conferences to present research and engage with their peers (Henderson and Cockburn, 1994; Stern, 2004). While this is true of scientists in industries like pharmaceuticals and semiconductors, it also applies to technologists in a wide range of other areas, such as developers in software, engineers in aerospace, or even R&D personnel in foods and cosmetics industries (Mollick, 2012). They are the locus of the technical expertise in the incumbent firm. Research has highlighted that the mental models prevailing in these parts of incumbent firms can be systematically different from those in the parts of the firm that are more focused on commercial operations such as distribution and marketing (Burgelman, 1991; Christensen *et al.*, 2018; Gavetti, Henderson, and Giorgi, 2003; Ruckert and Walker Jr, 1987). These parts of the firm control the complementary assets associated with translating technologies into commercial products, such as distribution or sales infrastructure and relationships with customers, suppliers, and regulators.

Given these systematic differences, I expect that a match between the type of corporate experience the startup possesses and the area of the established organization that controls the resource in question will likely facilitate better access to it. The shared experience arising from having previously worked in a similar environment can help entrepreneurs build relationships with managers in the established firm. The power of that shared experience, and hence the ability to build relationships, is likely to be accentuated when the entrepreneur's prior experience was in a similar role as the managers controlling the resources in question. A prior career working in R&D is on average more likely to enable relationship-building with R&D managers than a career working in sales.

The key theorized mechanism linking corporate experience with access to downstream complementary assets is an understanding of the way decisions regarding resource sharing are made in the established firm. Having prior experience in a similar area of an established firm will likely leave the entrepreneur with a better understanding of the

decision processes that characterize these specific parts of the organization. This in turn should help them obtain access to these resources for their startups. For instance, having extensive experience working in a sales organization is likely to engender a more instinctive understanding of the decision-making processes leading to the setting up of a distribution partnership than if that experience was in R&D. Hence,

Hypothesis 4a: Startups' access to their corporate investors' technical knowledge will be greater when their entrepreneurs have technology focused corporate experience than when their entrepreneurs have commercially focused corporate experience.

Hypothesis 4b: Startups' access to their corporate investors' downstream complementary assets will be greater when their entrepreneurs have commercially focused corporate experience than when their entrepreneurs have technology focused corporate experience.

DATA

The unit of analysis in this study is the established firm – startup dyad that results from a Corporate VC investment by the former in the latter. Most research in this domain has examined firm level outcomes such as profitability or patenting and how these correspond to receiving CVC investment. However, given that the value addition in these relationships ostensibly comes from dyad-specific exchanges of knowledge or other resources, our understanding could be enhanced by specifically examining whether, when, and to what degree these types of exchanges arise following a CVC investment.

My empirical context is the life sciences. I started by identifying every investment made by an established pharmaceutical firm in a US based life sciences startup between 2001 and 2011 using *Venture Xpert* as my data source. Of these, I only retained first time investments - follow on investments, i.e., investments by an established firm in a startup in which it has previously invested are dropped (Dushnitsky and Lenox, 2006). Hence, each established firm – startup dyad only appears once in the data, and I started with 327 dyads involving 236 startups and 28 established firms (some startups receive investment from multiple established firms). I collected data on the downstream alliances of these firms from the *Informa Medtrack* database, and information on their patents from the USPTO's

Patentsview database. I also use information on the drug portfolios of the startups and the established firms, which I obtain from the *Informa Pharmaprojects* database.

I then hand collected individual level data on the startups' senior management at the point at which they received investment. This included all individuals who occupied the following positions or their equivalents – President, Chief Executive Officer, Founder, Chief Operating Officer, Chief Business Officer, Chief Scientific Officer, Chief Medical Officer and Chief Technical Officer, the reason being that I was seeking to identify the individuals directly involved in interactions with the established firm, and in the key strategic and technological decisions of the startup. Lower-level employees are less likely to have the requisite level of influence. Similarly, non-executive board members are unlikely to be involved in the day-to-day work of the firm; hence, I only included executive employees. I started with the full list of executives associated with each startup in my sample. I then dropped those individuals who did not satisfy the criteria described above to arrive at a list of 554 names.

For each of these individuals, I then collected data on their career history. I did so via a manual search process. My primary source of data for this is *LinkedIn*, supplemented by other web sources such as *Bloomberg* and *Crunchbase*. For each individual, I collected information on the companies at which they previously worked (if any), and their educational qualifications. There are also 75 startups for which *Venture Xpert* did not provide any information on the executives at the required level of seniority. For these, I carried out a manual search process to first identify the names of the executives in the positions of interest, and then collect information on their backgrounds as done previously. This resulted in an additional 189 names to add to the previous 554. To identify the names of these individuals, the primary source of data was the internet archive (*archive.org*), supplemented by filings data from the SEC's *Edgar* database. Through this process, I was able to collect personnel data for all the startups in my sample.

I supplemented the primary archival data with information from interviews with 29 industry informants. I interviewed founders/managers of startups that had received venture capital from incumbent firms, employees of incumbent firms responsible for making and

managing these investments, and independent (i.e., non-corporate) venture capital investors who have co-invested with corporate investors. The focus of these interviews was on the types of exchanges that could arise between incumbent firm and startup personnel post-investment, the antecedents of these, and how they influenced the startups' outcomes. This fieldwork was intended to sharpen and illustrate the theoretical arguments, and to help interpret the mechanisms underlying the observed quantitative relationships in the data. It was not meant to represent a rigorous standalone qualitative research exercise.

Dependent Variables

1. Technical Knowledge: I measure technical knowledge flow to the startup as the number of citations made by patents filed by the startup after the investment has been made to patents owned by the incumbent firm, i.e., its corporate investor. The use of patent citations as a proxy for knowledge flows originates in the work of Jaffe, Trajtenberg, and Henderson (1993), who employed it to examine the geographic range of knowledge spillovers. The measure has subsequently become widely adopted across a range of disciplines to capture knowledge flows between individuals (e.g., Singh, 2005), divisions of an organization (e.g., Zhao, 2006), geographic regions (e.g., Branstetter, 2006), and firms (e.g., Mowery, Oxley, and Silverman, 1996). In particular, this has become the most widely used measure of knowledge flows arising in interfirm partnerships (e.g., Gomes-Casseres, Hagedoorn, and Jaffe, 2006; Oxley and Wada, 2009; Runge, Schwens, and Schulz, 2022). Corsino, Mariani, and Torrisi (2019: 1062), in a study examining the use of patent citations as a measure of knowledge flows, conclude that citations are an effective measure of knowledge flows arising from “informal interactions with employees of other organizations”. This is consistent with the underlying process of knowledge access I am seeking to capture in this setting.

2. Complementary Assets: I capture access to complementary assets based on the formation of downstream alliances between the startup and the established firm (i.e., its corporate investor) aimed at development or commercialization in the period following the investment. These represent substantially more targeted partnerships than CVC, typically focused on specific drugs or technologies, the formation of which lies outside the purview of the corporate VC division. Data on alliances comes from the *Informa Medtrack* database which

also provides a categorization of the intent of the partnership. The latter stages of the drug development process typically require a global base of complementary assets relating to manufacturing, distribution, and marketing, as well as legal and regulatory support (Dessain and Fishman, 2017). Incumbent firms in this industry typically own these assets, whereas building them internally is beyond most startups who must therefore access them by other means. The formation of these types of alliances is the clearest indicator of the startup accessing these resources belonging to the incumbent firm. I capture this as a count of downstream alliances formed between the startup and the established firm post-investment¹.

Independent Variables

The primary independent variable measures whether the entrepreneurs associated with a startup have previously worked in an established firm, the definition and measurement of which I derive from Chatterji (2009). For each individual associated with the startups in the sample, I identify whether they have any prior full-time work experience at an established firm in the same industry. For this, I use the 50 largest pharmaceutical companies in the world by annual drug sales as defined by Pharmaceutical Executive magazine in 2006, which is the mid-point of the sample. The top 50 firms are, in combination, responsible for a majority of global pharmaceutical sales, and represent a fairly comprehensive picture of the incumbent firms in the industry (see Eklund, 2022 for a similar approach). I then define the binary variable *corporate experience* as equal to 1 if any of the individuals associated with that startup have previously worked for one of the established pharmaceutical firms on this list. I also test the robustness of my findings to the use of a measure based on the proportion of entrepreneurial firm senior executives with corporate experience. Following Chatterji (2009), I retain the binary operationalization as my principal measure given the greater potential for inaccuracies in the proportional measure.

To test hypotheses 3 and 4, I further decompose this measure of corporate experience. First, I distinguish between corporate experience accrued at the specific incumbent firm that is the startup's investor and corporate experience accrued at other incumbent firms in the industry

¹ A binary operationalization provides consistent results, see the robustness section

to operationalize two binary variables: *corporate experience – investor*, and *corporate experience – noninvestor*.

Second, I consider the specific function of the pharmaceutical firm in which the corporate experience of the startup's managers was accrued. Careers in pharmaceuticals tend to be bifurcated into those that are focused on technology (i.e. R&D) or commercialization. I examine the roles held by the individuals within these firms primarily by examining their job titles and descriptions listed on *LinkedIn*, supplemented by profiles on their company webpages accessed via *archive.org*. The job titles typically offer a clear basis for discerning whether the individual's pharma career has principally been focused on R&D. Careers within R&D progress from relatively general investigational scientist roles towards leadership positions in more specialized labs or divisions focused on specific aspects of R&D (e.g., director of lead generation) or specific therapeutic areas (e.g., head of pulmonary research). Subsequently at higher levels of seniority, roles tend to become more general again (e.g., Senior VP, development). Careers that are commercialization focused tend to commence within areas such as sales, marketing or business development and progress along trajectories more analogous to careers in less technologically intensive industries. I classify an individual's corporate experience based on the types of roles in which they have spent the longest duration in their pharmaceutical careers. In the majority of cases, startup managers' prior careers are exclusively contained within either R&D or commercial roles, as switching between these is uncommon, especially at middle managerial levels. In instances where both are represented, I classify the individual based on the type of role in which they have spent the longest duration. In cases where duration information by role is not listed, I use the individual's summary / bio to make this distinction. While these descriptions are written with a strategic intent (for instance, to seek specific types of opportunities), given the relatively standardized career trajectories within this industry and markers of success (involvement in drug trials or product launches known to be successful), they offer a clear basis for making this distinction (e.g., Clinical development expert with extensive experience... vs e.g., Sales executive with proven track record...). On this basis, I develop two binary variables,

corporate experience – R&D, and *corporate experience – commercial* indicating whether the startup has a senior manager who possesses each of these forms of corporate experience.

I also develop measures to characterize other common types of entrepreneurial backgrounds in this industry. *Startup experience* indicates that the startup has an entrepreneur who has prior experience working for another startup in the life sciences. *Founding experience* indicates that the startup has an entrepreneur who was previously the *founder* of a startup (in contrast with *startup experience* which captures only whether they have experience working for a startup). *VC experience* indicates the presence of individuals who were previously employed by venture capital firms. *Science PhD* indicates whether the startup has an entrepreneur who has a doctorate in a scientific field. *Academic experience* indicates the presence of individuals who were previously employed in academia (as researchers or faculty, not students). I also control for a range of other characteristics of startup, incumbent, and dyad that could be related to the variables of interest. For a description of these variables and the reason for their inclusion, see appendix table A1.

Empirical Design

Each row in the data represents an established firm – startup dyad. The mechanisms underlying the hypotheses relate to the access the startup has to the established firm. The principal sources of bias in this setup therefore arise from the various observable and unobservable factors that relate to both the outcomes of interest and to corporate experience, but which are not related to the access the startup gets to the established firm. In addition to controlling for a range of important factors that could be relevant in this respect, I include established firm fixed effects. This means that all comparisons are restricted to being within the set of startups receiving investment from the same established firm. Hence, factors arising from differences between established firms such as their technological preferences, organizational structures, or the agreements they use to govern their CVC investments, are unlikely to bias the results.

I also restrict comparisons to within matched groups of startups. Following Pahnke *et al.* (2015), I use a coarsened exact matching (CEM) approach in which startups within a comparison group are required to match on some factors commonly considered by investors

in making their choice of startup. These factors include the age of the startup, its location, and its level of technological development measured in terms of the number of patents it has filed. Additionally, given my focus on the prior careers of the startup's managers as the explanatory variable, I match on two variables related to the quality of the human capital possessed by the startup, based on education and prior entrepreneurial success (Baum and Silverman, 2004; Tzabbar and Margolis, 2017). These capture respectively whether the startup's senior managers have a graduate degree (i.e. a master's or doctorate), and whether they previously founded a startup that achieved a liquidity event (i.e. acquisition or IPO).

In keeping with the CEM procedure, I coarsen startup age and patents into discrete bins based on their frequency distributions (Iacus *et al.*, 2012). For startup age, this consists of 7 bins, each indicating the startup's age from 1 to 6 years respectively, and the final bin encompassing all startups aged 7 or greater. In relation to patents, the variable is coarsened into 4 bins, consisting of 0, 1-5, 6-10, and greater than 10. On location, the startups in each bin are required to match exactly on 2 digit zipcode which roughly encompasses metropolitan areas in the US, and has been extensively used in prior research (Funk, 2014; Yue, Rao, and Ingram, 2013). The two human capital based factors are included as binary variables indicating the presence or absence of these features among the focal startup's senior managers. Applying these criteria and dropping unmatched observations results in 64 groups of matched startups. Comparisons are restricted to within these matched groups by including dummy variables for each matched group.

An important basis of distinction between firms in this industry relates to the therapeutic (i.e., disease) areas they are targeting. For instance, startups targeting different therapeutic areas may have different priorities and therefore may behave in systematically different ways. To account for this, I include dummy variables for each therapeutic class as defined by *Pharmaprojects*, separately for the startup and the incumbent firm. I also employ an instrumental variable approach to examining the relationships of interest which I will describe in the next section. While some of the analyses have outcome variables that may indicate the efficient application of non-linear models, in the interest of consistency and interpretability, I use OLS models to derive all estimates.

Findings – Access to Technical Knowledge and Complementary Assets

Table 1 shows the summary statistics for the variables of interest as well as their correlations. About 58% of the startups in the sample have an entrepreneur who was previously employed by a large pharmaceutical firm. This is in line with prior research showing that employment at an established firm is a common pathway towards entrepreneurship (Bhide, 1994; Gompers *et al.*, 2005). A similar proportion of startups also have an entrepreneur with prior experience working for a startup in the life sciences. In about a quarter of the dyads, the startup has an entrepreneur who has prior founding experience.

On average, the startups in the sample receive investment from a corporate investor at the age of 4.5 years, and have on average received 2 prior rounds of capital. While these startups, on average, have over 5 patents at the time they receive corporate investment, only in 25% of the cases does the startup have a single patent that is technologically novel based on the Fleming (2001) characterization. The average number of drugs the startups have put into phase 1 of human clinical trials when they receive investment is 0.4 (with a median of 0).

TABLE 1 HERE

Table 2 shows the regression analysis using knowledge flows to the startup as the outcome variable of interest (*technical knowledge*). Model 1 includes just the control variables along with the dummy variables to account for therapeutic focus area, restrict comparisons to within matched groups of startups, and established firm fixed effects. Model 2 introduces the variables relating to the backgrounds of the entrepreneurs. We observe a positive coefficient associated with the *corporate experience* variable ($p=0.015$). The magnitude of the coefficient indicates that on average, having corporate experience would increase citations to the established firm's patents by about half a standard deviation (~ 4 citations).

TABLE 2 HERE

Next, we consider the outcome *complementary assets*, which is the number of downstream alliances formed between the startup and the established firm aimed at the development or commercialization of the startup's technology. Model 3 shows the estimates with this variable as the outcome, regressed against the controls and fixed effects. Model 4 introduces the variables relating to the entrepreneurs' background. Once more, we observe a positive

coefficient associated with *corporate experience* indicating that startups with this type of experience are on average more likely to form downstream alliances with the established firm ($p=0.025$). Considering the median dyad in the sample has no downstream alliances between the startup and the established firm, the increase of about 0.4 alliances associated with *corporate experience* is economically meaningful.

Instrumental Variable Analyses

In combination, the results from table 2 provide broad support for hypotheses 1 and 2 i.e., startups with corporate experience have greater access to the established firm's technical knowledge and downstream complementary assets in these relationships. However, given corporate experience is not randomly assigned, startups with corporate experience may be distinct from ones without such experience in ways that also make them more likely to achieve these outcomes (via channels distinct from access). To address this, I draw on plausibly exogenous sources of variation in *corporate experience* via two instrumental variables identified in the literature as influencing the propensity of individuals to leave employment at an incumbent firm and join an entrepreneurial venture, either as a founder or an employee. The first relates to a driver of the level of risk associated with this choice – employee non-compete agreements. These agreements allow an employer to pursue legal action against an employee who joins a startup in the same industry. Such action can result in a cessation of the individual's involvement with the startup as well as substantial damages and legal expenses. Thus, non-competes add legal and financial risk to the inherent business risk associated with an entrepreneurial venture. An extensive body of literature has shown that these agreements can have a pronounced impact on who founds companies (e.g., Starr, Balasubramanian, and Sakakibara, 2018), as well as impairing the ability of startups to hire individuals with experience at incumbent firms (e.g., Marx, 2021).

The strength of noncompete enforcement in the United States is the prerogative of individual states and as a result, it has varied considerably over time and across locations. I employ the noncompete enforcement index developed by Marx (2021), which assigns a numerical value to the strength of the enforcement of noncompete agreements in each US state for every year from 1990 to 2014 (see Marx, 2021 online appendix A for detail on the

procedure used to calculate the index). A higher value on this index indicates a stronger noncompete regime prevailing in the jurisdiction at the time.

I operationalize my instrument as the value of Marx's (2021) noncompete index in the MSA of the startup five years prior to the year of investment. A stronger level of enforcement of noncompetes would suppress both the founding of new ventures by individuals employed at incumbent firms in this period, as well as the hiring of such individuals by existing startups. As a result, I expect this variable to be a negative predictor of whether the startup (at the point of receiving CVC investment) has a senior manager with corporate experience. Furthermore, this measure from five years before is unlikely to have a material impact on the startup's access to the incumbent firm's resources post-investment through other channels than whether it has a manager with corporate experience.

I also draw on another source of economic risk facing individuals moving from incumbent firm employment to a startup. Entrepreneurial ventures tend to have a high likelihood of failure, and joining one of these firms therefore entails greater uncertainty over the individual's future economic returns (Hall and Woodward, 2010; Knight, 1921). In contrast, employment at an incumbent firm would typically be considered safer. An individual's perception of the risk associated with making this transition is also likely to be influenced by the macroeconomic conditions around them. In circumstances that exacerbate the perceived risk, individuals are less likely to make this choice (Astebro *et al.*, 2014; Hvide and Panos, 2014). I draw on variations in the level of such perceived risk, for which I proxy using the unemployment rate in the Metropolitan Statistical Area (MSA) in which the startup is located (Yuen, 2021). I measure the unemployment rate as the ratio of the number of unemployed persons to the size of the total labor force in the MSA, the data for which comes from the US Bureau of Labor Statistics. I employ this measure from five years prior to the focal year of investment as an instrument for corporate experience. I expect the unemployment rate in the MSA to be a negative predictor of whether the startup has a senior manager with corporate experience in the focal year. However, the unemployment rate from five years ago is unlikely to affect the outcomes i.e., the startup's access to the incumbent firm's resources post-investment through any other channel.

I implement the instrumental variables estimation using a two stage least squares (2SLS) approach using all the same controls as in the preceding analyses. Model 5 of table 3 shows the result from the first stage regression where the outcome variable is corporate experience. We observe that the strength of *noncompete enforcement* ($p=0.020$) and the *unemployment rate* ($p<0.001$) each have a strong negative relationship with corporate experience. The F-statistic associated with these excluded instruments is 14.6, which helps assuage the concern that the instruments may be weak (Sanderson and Windmeijer, 2016; Stock and Yogo, 2002). Models 6 and 7 show the second stage results predicting *technical knowledge* and *complementary assets* respectively. Note that the first stage is only shown once since it is identical in both cases. We observe, consistent with the main results, that the instrumented corporate experience variable has a positive relationship with both technical knowledge flows to the startup ($p=0.015$) and downstream alliance formation ($p=0.008$). Having multiple instruments also means I can carry out a test of overidentifying restrictions which probes the validity of the instruments by examining whether each of the IVs separately provides estimates that are consistent with each other. The null hypothesis is that the instruments are valid, and the Sargan-Hansen test statistic does not provide grounds to reject it ($p=0.753$). In combination these results serve to strengthen the support for hypotheses 1 and 2, that corporate experience facilitates better access to the incumbent's technical knowledge and downstream complementary assets for startups.

TABLE 3 HERE

Investing-firm Experience

Next, I consider hypothesis 3, which relates to the specific form of corporate experience that arises when the startup's manager was previously an employee of the same incumbent firm which invests in the startup. While about 58% of the dyads in the sample consist of startups that have corporate experience, in about 8% of them that experience is specifically at the focal incumbent firm investing in the startup. We observe from model 8 of table 4 that both *corporate experience – investor* and *corporate experience – noninvestor* have positive relationships with the startup's access to the corporate investor's technical knowledge.

However, the magnitude of the coefficients indicates that the effect of experience at the focal

investor ($\beta = 6.9$, $p=0.034$) is substantially larger than that of generalized corporate experience ($\beta = 4.1$, $p=0.013$), with a Wald test showing these coefficients to be distinct ($p=0.08$). This provides support for hypothesis 3a. Model 9 of table 4 shows the equivalent results for the outcome variable *complementary assets*. Generalized corporate experience, i.e. *corporate experience – noninvestor* has a positive relationship with the outcome ($p=0.025$). However, the effect of *corporate experience – investor* is weaker ($p=0.157$). Hence, we do not see support for hypothesis 3b.

A possible explanation for this discrepancy lies in the processes by which access to technical knowledge and complementary assets come about. While the former is typically brought about via informal exchanges with the relevant personnel within the incumbent firm, the formation of a downstream alliance is a more formal process requiring official sanction, typically from a more central source of authority in the organization. Research has highlighted a common process of entrepreneurial spawning from within incumbent firms – the entrepreneur develops an idea during their employment within the incumbent firm, but they are blocked from pursuing it internally and thus decide to do so externally via a venture (e.g. Cassiman and Ueda, 2006; Gompers *et al.*, 2005; Habib, Hege, and Mella-Barral, 2013). The startup thus formed, if it receives VC investment from the larger firm, may still be able to informally draw on the knowledge present within the latter given the entrepreneur’s connections within the firm. However, the same factors that blocked the entrepreneur’s pursuit of the idea internally are likely to impede the formation of a formal downstream partnership, where the incumbent firm actively deploys its complementary assets to develop and commercialize the startup’s product. This would lead to a pattern consistent with the results we observe – a pronounced effect on (informal) knowledge flows but a dampened relationship with (formal) downstream alliance formation.

TABLE 4 HERE

Technological vs Commercial Corporate Experience

Hypothesis 4 was based on the distinction between technology focused and commercially focused corporate experience, suggesting that the former would have a stronger impact on the startup’s access to technical knowledge and the latter on downstream complementary assets.

About 36% of the startups in the sample have technology-focused corporate experience, whereas 29% have commercial corporate experience. Model 10 of table 5 shows the results with *technical knowledge* as the outcome. *Corporate experience – R&D* has a positive effect on the startup's access to the incumbent's technical knowledge ($\beta = 4.1$, $p=0.032$), whereas the effect of *corporate experience – commercial* is substantially smaller ($\beta = 1.5$, $p=0.350$). A Wald test confirms this difference ($p=0.08$). Hence, hypothesis 4a is supported.

Model 11 of table 5 shows the results with *complementary assets* as the outcome. The results show that *corporate experience – R&D* ($\beta = 0.238$, $p=0.021$) and *corporate experience – commercial* ($\beta = 0.563$, $p=0.017$) both have positive relationships with the startup's propensity to access the corporate investor's downstream complementary assets. However, the coefficient associated with commercial corporate experience is considerably larger ($p=0.03$ from Wald test). Hence, we find support for hypothesis 4b. These results confirm our expectation that prior experience working in a pharmaceutical firm in an R&D role has a larger impact on access to technical knowledge than experience in a more market focused role, whereas the opposite is true for the formation of alliances focused on drug development and commercialization.

TABLE 5 HERE

I examined the robustness of these results to the use of a proportional measure of corporate experience, as well as dichotomized versions of the dependent variables. These analyses, along with further tests of alternative explanations, are shown in the appendix.

Exit – Startups' Likelihood of Achieving a Liquidity Event

A question that follows from these findings is how enhanced access to the established firm's resources may impact the startup's ultimate financial outcome, typically measured as whether the startup achieves an exit, i.e. a liquidity event (Kaplan and Lerner, 2010). To probe this empirically, I code *exit* as a binary measure which takes the value of 1 if the startup was acquired or if it carries out an initial public offering (IPO) of its stock on the public markets, and 0 otherwise. Note that these results should be interpreted with caution given the empirical design is dyadic, whereas the outcome of exit pertains exclusively to the focal startup. Model 12 of table 6 shows *exit* regressed against all our explanatory variables and controls. The

coefficient associated with corporate experience is inconclusive ($p=0.634$). Hence, within this sample of startups, accounting for various visible indicators of pre-investment quality, we see no evidence that corporate experience is, on average, associated with a greater likelihood of exit. This remains true when the exit variable separately captures IPO and acquisition (models 13,14).

The literature on Corporate VC has largely regarded a lack of access to the incumbent firm's resources as the principal impediment to startups realizing value from these relationships (Pahnke *et al.*, 2015). The finding that corporate experience is on average associated with greater access to the incumbent's resources, but not with a greater likelihood of exit suggests that more access is perhaps not unequivocally better for the startup from the perspective of exit, or at least that there may be some heterogeneity in the value of this access. To probe this heterogeneity further at the dyad level, I examine how the relationship between access and exit varies based on the degree to which the startup is targeting an area in which the established firm has direct experience and therefore, relevant expertise to offer. In the life sciences, this is defined by therapeutic class, the specific disease areas the startup aims to target with its drugs. I operationalize this variable using data from *Pharmaprojects*, which classifies drugs into 18 therapeutic areas. Following Bar and Leiponen (2012), I capture therapeutic area overlap as $\sum \min(x_i, y_i)$ where x_i and y_i are the proportions of the established firm's and startup's drugs in therapeutic area i respectively. I then interact this variable with corporate experience to examine how it moderates the relationship between corporate experience and exit (model 15 of table 6).

There is a positive interaction effect ($p=0.029$), suggesting that the effect of corporate experience on exit becomes more positive at higher levels of therapeutic area overlap. When therapeutic area overlap is low, the relationship between corporate experience and exit is practically flat or declining, whereas at a higher level of therapeutic area overlap this relationship becomes noticeably more positive, i.e., corporate experience is associated with a considerable increase in the likelihood of the startup achieving an exit. At the 10th percentile of therapeutic area overlap, the marginal effect of corporate experience on exit is negative ($\beta= -0.127$, $p=0.181$), whereas at the 90th percentile, this relationship is positive ($\beta=0.316$,

p=0.046), with the difference between the coefficients via a comparative test displaying a p-value of 0.018.

TABLE 6 HERE

Juxtaposed with the previous results, this would indicate that the value of enhanced access to the established firm in corporate VC relationships is contingent on the nature of the expertise available within that firm, specifically whether the firm has expertise relevant to the application area the startup is focused on.

DISCUSSION

This study adds to the growing body of evidence attesting to the significance of entrepreneurs' prior careers for the strategies and outcomes of their ventures. In particular, the findings add to the research on entrepreneurs who were previously employees of incumbent firms in the same industry. While research in this domain has demonstrated that startups founded by these types of individuals possess some important advantages (Chatterji, 2009), these findings have been accompanied by calls for more work examining the mechanisms underlying these advantages. Cooperative relationships with more established firms are an important complement to the startup growth process in most industries, and managing these relationships is therefore a critical skill for entrepreneurs. My findings suggest that this is an area where entrepreneurs with prior experience working at established firms may be at an advantage compared to other types of entrepreneurs. I find that corporate experience can enhance the startup's access to the established firm's technical expertise, which can be critical to technological invention and refinement (Hess and Rothaermel, 2011). Corporate experience is also associated with enhanced access to the downstream complementary assets of the established firm relating to product development and commercialization (Åstebro and Serrano, 2015). I also find evidence for some divergence in the nature of the corporate experience that promotes access to each of these resources. Corporate experience that is R&D focused is more beneficial to accessing technical knowledge, whereas corporate experience in a commercially focused role is more beneficial to accessing downstream complementary assets. While prior experience working for the focal corporate investor substantially enhances informal knowledge flows, I find no such effect in

relation to formalized agreements aimed at providing access to downstream complementary assets. Finally, the findings indicate that from the perspective of achieving an exit, the value of the enhanced access facilitated by corporate experience is greatest when the startup is targeting an application area in which the corporate investor has direct experience.

The study also contributes to research on corporate venture capital, particularly its implications for entrepreneurial firms. Research in this domain has found substantial heterogeneity in whether these relationships benefit startups (Alvarez-Garrido and Dushnitsky, 2016; Basu *et al.*, 2016; Kim and Park, 2017). A major impediment to these benefits arises from the organizational complexity of the established firms that the startups need to navigate to unlock value (Pahnke *et al.*, 2015). This study takes the next step of examining what factors may influence the ability of a startup to do so. Shifting the level of analysis to the dyad allows me to probe the antecedents of the flow of resources between the firms, i.e., I attempt to capture these flows rather than inferring their occurrence based on firm level outcomes as much of the prior work in this domain has done. My findings suggest that some of the heterogeneity in the resource access facilitated by these relationships is likely to be driven by entrepreneurs being differentially equipped to navigate them. Practically, these findings highlight the importance of two conditions for startups to benefit from these relationships – that the established firm has expertise salient to the challenges the startup is facing, and that there are mechanisms available to enable startups to navigate these organizations effectively. My findings indicate the entrepreneur’s prior experience could be an important mechanism to help with the latter.

Some additional caveats need to be made about these findings. First, I capture access to technical knowledge and downstream complementary assets using the imperfect proxies of patent citations and alliance formation. Capturing these at the dyad level rather than inferring their existence based on firm level outcomes represents an advance on the existing literature on corporate VC. However, they are not comprehensive measures of the underlying constructs and there may be aspects of technical knowledge exchange or access to downstream complementary assets that they are not capturing. To the extent that those hidden aspects are correlated with entrepreneurs’ prior experience, they are salient but beyond the

field of visibility of the analyses conducted here. Future research may be able to make progress on these by using more refined measures of resource flows between firms, perhaps using analyses of textual or verbal communication between the firms.

Second, the results pertain to a particular industry - the life sciences, which displays some particularities with respect to the innovation processes and the relationships between startups and established firms (Dessain and Fishman, 2017). In other industries the specific resources of the established firm that can add value to the startup may vary in type and intensity. However, the elements that make up the building blocks of this study – the distinctive value of access to the established firm’s resources and the organizational impediments to that access, have been shown to exist in other contexts as well (e.g. Pahnke *et al.*, 2015; Strebulaev and Wang, 2021). The notion that prior experience in a particular institutional environment can help with navigating another similar environment is also broadly generalizable (Marquis and Tilcsik, 2013). Hence, I would expect the basic theorized relationships to be broadly generalizable, but the nature and strength of the underlying mechanisms enabling access are likely to vary in conjunction with the type of resource in question and the impediments the startups face in accessing them. More research will be needed to discern whether these relationships play out similarly in other settings.

Third, while the focus on the established firm – startup dyad helps us obtain a more fine-grained picture of the exchanges underlying these relationships, it also means that the study sample consists only of dyads that exist, i.e. partnerships that actually arose between an established firm and a startup. I attempt to account for heterogeneity between dyads driven by selection by using drivers of variance in corporate experience that are plausibly exogenous to the dynamics shaping the formation of the dyad. However, the possibility of such heterogeneity represents a limitation to the degree to which the inferences can be generalized.

Despite these and other limitations, this study represents a meaningful addition to recent work highlighting the importance of intra-firm factors in shaping the exchanges that arise in inter-firm relationships (e.g., Balachandran and Eklund, 2023). Classic approaches to examining interfirm relationships adopt monolithic views of firms to examine how their aggregate characteristics, such as their resources and capabilities, affect the formation and

performance of interfirm ties. However, the backgrounds and experiences of the people interacting in these relationships are also likely to play a systematic role in determining how they play out. The findings here demonstrate how investigating them more closely may allow us to better understand how these partnerships shape firms' outcomes.

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TABLES

Table 1: Summary Statistics and Correlations

Sl	Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27				
1	Technical Knowledge	1.60	10.1	0	160	1.00																														
2	Complementary Assets	0.11	0.53	0	6	0.12	1.00																													
3	Exit	0.35	0.48	0	1	0.01	0.07	1.00																												
4	Corporate experience	0.58	0.49	0	1	0.09	0.11	0.06	1.00																											
5	Startup experience	0.56	0.50	0	1	-0.01	-0.10	-0.06	-0.07	1.00																										
6	Founding experience	0.22	0.42	0	1	-0.05	0.01	0.07	-0.19	0.38	1.00																									
7	VC experience	0.10	0.30	0	1	-0.05	-0.02	0.09	-0.07	0.07	0.00	1.00																								
8	Science PhD	0.70	0.46	0	1	-0.02	-0.04	-0.11	0.12	0.08	0.09	-0.09	1.00																							
9	Academic experience	0.28	0.45	0	1	-0.02	-0.05	-0.07	-0.18	-0.25	-0.06	-0.11	0.15	1.00																						
10	Investor avg. VC experience	4.37	2.57	0	13.3	-0.08	-0.04	-0.03	-0.05	0.05	0.08	0.09	-0.06	-0.04	1.00																					
11	Investor av. firm tenure	7.05	4.01	0	17.3	-0.05	-0.03	-0.07	-0.07	-0.05	0.00	-0.02	-0.03	0.07	0.38	1.00																				
12	Startup age	4.78	3.90	1	21	0.05	0.14	0.02	-0.06	-0.06	-0.01	-0.11	-0.06	0.06	0.00	-0.04	1.00																			
13	Startup prior rounds	2.34	2.41	0	12	0.07	0.15	0.07	0.04	-0.01	-0.04	-0.09	-0.03	-0.09	0.01	-0.07	0.56	1.00																		
14	Startup patents filed	5.09	21.0	0	277	0.15	0.21	0.04	0.06	-0.12	-0.07	-0.05	0.05	0.00	-0.05	0.00	0.37	0.17	1.00																	
15	Novel technology	0.25	0.43	0	1	0.17	0.10	0.02	0.05	-0.10	-0.06	-0.11	0.08	0.08	-0.06	-0.09	0.33	0.30	0.36	1.00																
16	Startup drugs in trial	0.42	1.11	0	9	0.03	0.00	0.03	0.08	0.00	0.01	-0.03	-0.03	-0.02	0.05	-0.06	0.35	0.30	0.10	0.06	1.00															
17	Pre-inv. startup to incumbent cites	0.37	3.34	0	58	0.87	0.04	-0.03	0.07	-0.01	-0.05	-0.03	0.03	-0.03	-0.05	-0.07	0.10	0.06	0.30	0.17	0.04	1.00														
18	Pre-inv. incumbent to startup cites	0.29	3.22	0	51	0.06	0.16	0.03	0.07	-0.10	-0.04	-0.02	0.05	-0.05	-0.03	0.00	0.25	0.04	0.90	0.15	0.00	0.28	1.00													
19	Technological overlap	0.09	0.18	0	1	0.19	0.12	0.15	0.07	-0.15	-0.08	-0.06	0.07	0.02	-0.07	-0.04	0.30	0.21	0.43	0.53	0.10	0.19	0.26	1.00												
20	Therapeutic area overlap	0.14	0.21	0	0.74	0.09	0.03	0.20	0.10	-0.02	-0.03	0.00	-0.02	0.05	0.04	-0.07	0.22	0.28	0.04	0.16	0.44	0.09	-0.02	0.21	1.00											
21	Number of VCs	6.02	3.86	0	22	0.06	0.05	0.18	0.03	-0.03	0.00	-0.08	0.02	0.01	-0.14	-0.12	0.37	0.60	0.10	0.36	0.20	0.04	-0.04	0.29	0.27	1.00										
22	Other CVC	0.31	0.46	0	1	-0.02	0.01	0.05	0.01	0.09	0.12	-0.05	0.02	-0.08	-0.12	-0.06	0.08	0.07	-0.05	-0.06	-0.08	-0.06	-0.06	-0.04	0.04	0.25	1.00									
23	Startup Alliances	2.42	5.01	0	35	0.16	0.21	0.08	0.01	-0.14	0.01	-0.07	0.04	0.08	-0.21	0.00	0.07	0.02	0.11	0.13	0.02	0.13	0.03	0.11	0.06	0.08	-0.03	1.00								
24	Corporate experience - Noninvestor	0.50	0.50	0	1	0.08	0.09	0.03	0.85	-0.03	-0.17	-0.04	0.07	-0.16	0.01	-0.07	0.02	0.10	0.02	0.08	0.07	0.08	0.03	0.06	0.07	0.05	0.04	-0.02	1.00							
25	Corporate experience - Investor	0.08	0.27	0	1	0.01	0.04	0.06	0.25	-0.07	-0.04	-0.06	0.10	-0.03	-0.10	0.00	-0.14	-0.11	0.07	-0.05	0.02	-0.02	0.08	0.02	0.06	-0.04	-0.07	0.06	-0.30	1.00						
26	Corporate experience - R&D	0.37	0.48	0	1	0.00	-0.01	-0.01	0.64	-0.06	-0.12	-0.12	0.28	-0.16	-0.06	-0.10	-0.12	-0.03	0.01	-0.01	-0.04	-0.03	0.05	-0.01	-0.02	0.02	0.15	-0.05	0.51	0.22	1.00					
27	Corporate experience - Commerical	0.29	0.45	0	1	0.09	0.18	0.13	0.55	-0.06	-0.13	0.05	-0.09	-0.13	0.00	-0.02	0.06	0.10	0.05	0.05	0.22	0.10	0.03	0.10	0.18	0.02	-0.13	0.01	0.47	0.13	-0.13	1.00				

Table 2: Startups' Access to the Corporate Investor's Technical Knowledge and Complementary Assets

Dependent variable -	Technical Knowledge				Complementary Assets			
	Model 1		Model 2		Model 3		Model 4	
	Coef.	p val.	Coef.	p val.	Coef.	p val.	Coef.	p val.
Corporate experience			4.235 (1.602)	0.015			0.403 (0.167)	0.025
Startup experience			0.629 (0.982)	0.529			-0.234 (0.189)	0.229
Founding experience			-0.524 (1.272)	0.684			0.243 (0.262)	0.365
VC experience			1.221 (1.268)	0.347			-0.122 (0.278)	0.667
Science PhD			0.257 (1.607)	0.874			-0.191 (0.217)	0.387
Academic experience			2.666 (2.108)	0.220			0.077 (0.107)	0.482
Investor avg. VC experience	-0.083 (0.347)	0.813	-0.006 (0.429)	0.989	0.066 (0.040)	0.113	0.073 (0.037)	0.064
Investor av. firm tenure	-0.299 (0.215)	0.179	-0.366 (0.251)	0.159	-0.031 (0.028)	0.279	-0.034 (0.028)	0.242
Startup age	0.051 (0.541)	0.926	0.318 (0.445)	0.483	0.056 (0.066)	0.411	0.079 (0.053)	0.148
Startup prior rounds	0.389 (0.271)	0.166	0.431 (0.203)	0.046	-0.014 (0.027)	0.605	-0.006 (0.021)	0.761
Startup patents filed	0.047 (0.118)	0.694	0.032 (0.095)	0.741	-0.002 (0.013)	0.874	0.000 (0.011)	0.995
Novel technology	-0.097 (2.653)	0.971	0.113 (2.028)	0.956	0.263 (0.244)	0.293	0.334 (0.170)	0.063
Startup drugs in trial	-0.394 (0.744)	0.603	-0.536 (0.736)	0.474	0.032 (0.068)	0.640	0.089 (0.079)	0.271
Pre-inv. startup to incumbent cites	2.417 (0.436)	0.000	2.368 (0.344)	0.000	0.057 (0.067)	0.399	0.024 (0.050)	0.631
Pre-inv. incumbent to startup cites	-0.278 (0.957)	0.774	-0.239 (0.712)	0.740	0.076 (0.092)	0.416	0.060 (0.078)	0.448
Technological overlap	2.445 (7.803)	0.757	-1.100 (7.772)	0.889	-0.066 (0.571)	0.909	-0.165 (0.509)	0.748
Therapeutic area overlap	-2.445 (3.548)	0.498	-2.849 (3.220)	0.386	-0.490 (0.736)	0.513	-0.722 (0.696)	0.311
Number of VCs	-0.032 (0.131)	0.811	-0.039 (0.162)	0.811	-0.003 (0.025)	0.899	-0.013 (0.027)	0.643
Other CVC	0.058 (0.679)	0.933	0.839 (0.915)	0.369	0.002 (0.109)	0.986	-0.008 (0.133)	0.955
Startup Alliances	-0.008 (0.216)	0.971	0.047 (0.166)	0.780	0.041 (0.017)	0.023	0.042 (0.017)	0.024
Startup therapeutic area dummies	Y		Y		Y		Y	
Incumbent therapeutic area dummies	Y		Y		Y		Y	
Matched startup dummies	Y		Y		Y		Y	
Investing Firm fixed effects	Y		Y		Y		Y	
R - squared (within)	0.484		0.568		0.477		0.579	
Number of observations	220		220		220		220	

Standard errors shown in parentheses are clustered at the level of the investing firm.

The dependent variable in models 1 and 2 is the number of citations made by the startup's patents to those of the established firm post investment.

The dependent variable in models 3 and 4 is the number of alliances between the established firm and the startup formed post investment aimed at development or commercialization of the startup's technology

Table 3: Instrumental Variable Analyses Using 2SLS

Dependent Variable -	First Stage		Second stage			
	Corporate experience		Technical Knowledge		Complementary Assets	
	Model 5		Model 6		Model 7	
	Coef.	p val.	Coef.	p val.	Coef.	p val.
Noncompete enforcement	-0.014 (0.006)	0.020				
Unemployment rate	-0.157 (0.030)	0.000				
Corporate experience			4.557 (1.721)	0.015	0.888 (0.301)	0.008
Startup experience	-0.099 (0.098)	0.311	0.640 (1.035)	0.543	-0.218 (0.222)	0.338
Founding experience	-0.123 (0.123)	0.322	-0.478 (1.129)	0.676	0.313 (0.295)	0.301
VC experience	-0.347 (0.081)	0.000	1.312 (0.997)	0.202	0.016 (0.265)	0.951
Science PhD	-0.182 (0.093)	0.052	0.257 (1.618)	0.875	-0.192 (0.223)	0.398
Academic experience	-0.378 (0.146)	0.011	2.768 (1.412)	0.063	0.231 (0.167)	0.181
Investor avg. VC experience	0.070 (0.029)	0.018	-0.012 (0.433)	0.979	0.065 (0.039)	0.108
Investor av. firm tenure	-0.035 (0.017)	0.045	-0.362 (0.256)	0.172	-0.029 (0.031)	0.361
Startup age	-0.011 (0.056)	0.841	0.330 (0.494)	0.511	0.097 (0.047)	0.050
Startup prior rounds	0.033 (0.034)	0.325	0.430 (0.199)	0.042	-0.007 (0.027)	0.800
Startup patents filed	-0.005 (0.010)	0.577	0.031 (0.096)	0.749	-0.001 (0.011)	0.943
Novel technology	-0.043 (0.217)	0.845	0.137 (2.146)	0.950	0.371 (0.215)	0.100
Startup drugs in trial	-0.034 (0.073)	0.636	-0.529 (0.704)	0.461	0.100 (0.093)	0.295
Pre-inv. startup to incumbent cites	0.022 (0.047)	0.637	2.367 (0.335)	0.000	0.023 (0.050)	0.653
Pre-inv. incumbent to startup cites	0.054 (0.076)	0.484	-0.239 (0.696)	0.735	0.061 (0.081)	0.462
Technological overlap	0.889 (0.494)	0.075	-1.371 (9.588)	0.888	-0.573 (0.687)	0.413
Therapeutic area overlap	0.031 (0.470)	0.948	-2.904 (2.952)	0.336	-0.805 (0.793)	0.322
Number of VCs	-0.012 (0.019)	0.521	-0.040 (0.168)	0.814	-0.014 (0.033)	0.667
Other CVC	-0.031 (0.106)	0.768	0.852 (0.896)	0.352	0.012 (0.179)	0.949
Startup Alliances	-0.007 (0.012)	0.582	0.049 (0.176)	0.784	0.044 (0.014)	0.005
Startup therapeutic area dummies	Y		Y		Y	
Incumbent therapeutic area dummies	Y		Y		Y	
Matched startup dummies	Y		Y		Y	
Investing Firm fixed effects	Y		Y		Y	
F stat. (excluded instruments)	14.6					
R - squared (within)	0.413		0.568		0.499	
Number of observations	220		220		220	

Standard errors shown in parentheses are clustered at the level of the investing firm.

Noncompete enforcement is the strength of the enforcement of noncompete agreements, drawn from Marx's (2021) index for the startup's location five years prior to the year of investment. Unemployment rate is the ratio of unemployed persons to the size of the total labor force in the MSA of the startup measured five years prior to the year of investment. First stage is identical for both outcomes and hence is only shown once.

Table 4: Investor vs. Noninvestor Corporate Experience

Dependent variable -	Technical Knowledge		Complementary Assets	
	Model 8		Model 9	
	Coef.	p val.	Coef.	p val.
Corporate experience - Noninvestor	4.117 (1.524)	0.013	0.405 (0.168)	0.025
Corporate experience - Investor	6.953 (3.057)	0.034	0.364 (0.248)	0.157
R - squared (within)	0.580		0.579	
Number of observations	220		220	

Standard errors shown in parentheses are clustered at the level of the investing firm.

Models include all controls, startup therapeutic area dummies, incumbent therapeutic area dummies, matched startup dummies, and investing firm fixed effects.

Corporate experience – Investor is equal to 1 if the startup has a senior manager who was previously employed at the incumbent firm that is the focal corporate investor in the dyad, and 0 otherwise. Corporate experience – Noninvestor is equal to 1 if the startup has a senior manager who was previously employed at any incumbent firm in the industry other than the focal corporate investor, and 0 otherwise.

Table 5: Technological vs. Commercial Corporate Experience

Dependent variable -	Technical Knowledge		Complementary Assets	
	Model 10		Model 11	
	Coef.	p val.	Coef.	p val.
Corporate experience – R&D	4.149 (1.808)	0.032	0.238 (0.096)	0.021
Corporate experience - Commercial	1.559 (1.631)	0.350	0.563 (0.217)	0.017
R - squared (within)	0.553		0.608	
Number of observations	220		220	

Standard errors shown in parentheses are clustered at the level of the investing firm.

Models include all controls, startup therapeutic area dummies, incumbent therapeutic area dummies, matched startup dummies, and investing firm fixed effects.

Corporate experience – R&D is equal to 1 if the startup has a senior manager who was previously employed at an incumbent firm in a technology focused role and 0 otherwise. Corporate experience – Commercial is equal to 1 if the startup has a senior manager who was previously employed at an incumbent firm in a commercialization focused role and 0 otherwise. See the variable descriptions for more detail on the measurement of these.

Table 6: Exit

Dependent variable -	Exit		IPO		Acquisition		Exit	
	Model 12		Model 13		Model 14		Model 15	
	Coef.	p val.	Coef.	p val.	Coef.	p val.	Coef.	p val.
Corporate experience	-0.039 (0.080)	0.634	0.053 (0.073)	0.476	-0.086 (0.071)	0.241	-0.127 (0.095)	0.196
Corporate experience x Therap. area overlap							0.887 (0.373)	0.027
R - squared (within)	0.504		0.554		0.365		0.519	
Number of observations	220		220		220		220	

Standard errors shown in parentheses are clustered at the level of the investing firm.

Models include all controls, startup therapeutic area dummies, incumbent therapeutic area dummies, matched startup dummies, and investing firm fixed effects.

The dependent variable exit indicates whether the startup listed its shares on public markets (i.e., conducted an IPO) or was acquired post investment.