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# The role of large corporations in entrepreneurial ecosystems – a case study of Munich

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## ABSTRACT

A critical omission in research on entrepreneurial ecosystems is the role of large firms. It is claimed that they are critical actors. However, the current consensus – which suggests that their effects are entirely beneficial – is superficial. We present evidence from a case study of Munich, a city that combines an emerging ecosystem with a strong corporate sector, which indicates that the reality is much more nuanced. We confirm the resource-enriching effects of corporations. However, we also identify adverse impacts on the entrepreneurial culture that arise from their conservative and risk-avoiding mindset.

## NON-TECHNICAL ABSTRACT

Corporations are one of the most significant actors in entrepreneurial ecosystems. They are widely regarded as having a positive influence on local entrepreneurial activity. However, our study of Munich shows that they also have adverse effects, especially on entrepreneurial culture. We find that although corporations provide valuable resources into the entrepreneurial ecosystem, their conservative mindset, self-interested behaviour, and siloed activities negatively impact local entrepreneurial culture and undermine the community aspect of entrepreneurship. These adverse effects could be mitigated by corporations adopting agile practices when collaborating with disruptive start-ups, developing them into future business partners rather than a source of technical and business talent, and building ecosystem-wide networks with other actors. It is therefore essential that corporations are part of the leadership group of entrepreneurial ecosystems.

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## 1. Introduction

Entrepreneurial activity is largely a local phenomenon that is embedded in place. Hence geographical context can either enable or constrain entrepreneurship (Acs et al. 2017), resulting in significant geographical variations in entrepreneurial activity (Brown and

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Mason 2017). Entrepreneurial ecosystems (EEs) is a concept borrowed from biology (Isenberg 2011; Stam and van de Ven 2021) that explains the nature of places in which entrepreneurial activity flourishes and, by implication, where it does not (Audretsch and Belitski 2021). They comprise numerous actors who – either directly or indirectly – provide resources that are required for entrepreneurial activity. However, entrepreneurial ecosystems are not self-contained: resources that are not available locally may be attracted via ‘pipelines’ from other locations (Bathelt, Malmberg, and Maskell 2004). Stam and van de Ven (2021) identify seven types of resource endowments: physical resources, demand, intermediaries, knowledge, talent, leadership and finance; along with institutional arrangements comprising formal institutions, culture and networks. Each ecosystem emerges under a unique set of conditions and circumstances (Alvedalen et al. 2017; Mason and Brown 2014) which influence the composition, contribution and influence of ecosystem actors. Consequently, entrepreneurial ecosystems have different configurations of resource endowments and institutional arrangements.

However, it is recognised that the effectiveness of entrepreneurial ecosystems does not arise from the mere presence of actors but rather their interactions, interdependencies and connectivity (Spigel 2017; Stam and van de Ven 2021; Wurth, Stam, and Spigel 2022). Indeed, this is fundamental to the definition of entrepreneurial ecosystems as ‘a set of interconnected entrepreneurial actors, entrepreneurial organisations, institutions and entrepreneurial processes which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment’ (Mason and Brown 2014, 5). Although there are numerous studies that identify and document ecosystem components, ‘how these elements interact has comparatively received less attention’ (Ghio, Guerini, and Rossi-Lamastra 2019, 523) which results in insufficient understanding of their interactions and interdependencies (Frimanslund, Kwiatkowski, and Oklevik 2023). As Ghio, Guerini, and Rossi-Lamastra (2019) comment, investigation of actor interactions is ‘crucial to fully comprehend how ecosystems nurture the creation and growth of new ventures in geographical areas’ (524). However, research has mostly adopted a systems perspective, with the specific roles of individual actors and their interactions with other actors largely overlooked.

A critical omission in ecosystem research is the role of large firms (Brown and Mason 2017, 15). Mason and Brown (2014) state that ‘at the heart of an entrepreneurial ecosystem typically there is at least one, and usually several large businesses’ (9). Indeed, Isenberg (2013) argues that ‘you simply cannot have a flourishing entrepreneurship ecosystem without large companies to cultivate it, intentionally or otherwise’ (15). However, Isenberg’s statement has not been adequately investigated and hence remains an assertion. This paper adopts an assumption-challenging approach (Alvesson and Sandberg 2011) which asks three related questions. First, is this claim valid? Second, how do corporations shape the configuration of entrepreneurial ecosystems? Third, as implied in Isenberg’s statement, do corporations play an entirely positive role? Using Stam and van de Ven’s (2021) entrepreneurial ecosystem framework, we explore these questions through a case study of Munich (Germany) in which we investigate the contribution of large corporations to the resource endowments of its entrepreneurial ecosystem, their impact on institutional arrangements

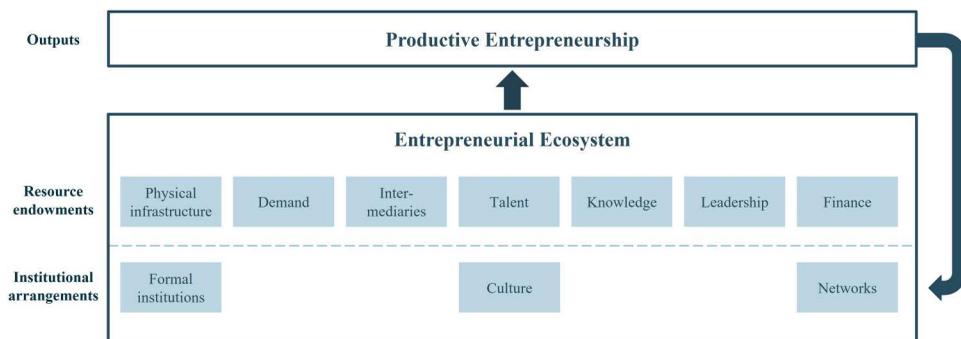
and their interactions with other entrepreneurship actors. Our evidence provides a more nuanced perspective on the role of large corporations in entrepreneurial ecosystems.

## 2. The role of corporations in entrepreneurial ecosystems

Awareness of geographical variations in entrepreneurial activity has led to increased efforts to understand the key determinants of supportive entrepreneurship environments. This has resulted in the development of numerous ecosystem models (Isenberg 2011; Spigel 2017; Stam 2015), with each taking a unique perspective on the elements and relationships required for vibrant entrepreneurial ecosystems. One particularly influential model was proposed by Stam and van de Ven (2021) (Figure 1). It synthesises the most discussed elements of entrepreneurial ecosystems into two categories – institutional arrangements and resource endowments – which will guide our subsequent analysis.

The institutional arrangements form the fundamental preconditions for economic activity and enable the productive use of the ecosystem's resources. These are reflected in entrepreneurship-friendly policies (Isenberg 2011; Mason and Brown 2014), a supportive entrepreneurial culture and dense networks which impact the fluidity of resources and relationships within ecosystems (Saxenian 1996). The resource-endowing elements encompass the regional infrastructure, which enables access to local and global markets, the presence of supportive intermediaries, talent that is willing to work at start-ups, knowledge about new opportunities, enabling leadership, and the availability of finance (Isenberg 2011). Together, these components and their interdependencies determine the level of productive entrepreneurship (Stam and van de Ven 2021). This becomes a self-sustaining process as successful founders who exit their businesses start new businesses or recycle their wealth and experience by engaging in roles such as angel investors, mentors and advisors, and institution builders (Mason and Harrison 2006).

In the following discussion we use Stam and van de Ven's (2021) framework (Figure 1) to bring together the available evidence on the contribution of large firms to the resource endowments and institutional arrangements which constitute self-sustaining ecosystems. This, in turn, engages with three additional research streams: First are studies that



**Figure 1.** Integrative entrepreneurial ecosystem model (Stam and van de Ven 2021).

investigate the direct interactions and cooperation of corporations and start-ups, including the open innovation literature (e.g. Bogers et al. 2017; Chesbrough 2006). Second are studies that focus on understanding the effects of MNE activity on entrepreneurial ecosystems. This includes both conceptual investigations into the impact of MNE activity (Bhawe and Zahra 2019) and acquisitions (Zahra and Hashai 2022) on the performance of entrepreneurial ecosystems and studies of the effects of MNEs on the emergence and growth of entrepreneurial ecosystems (Ryan et al. 2021). And third are studies of entrepreneurial ecosystems which shed light on the role of corporations within them (e.g. Spigel 2017).

### 2.1. Resource endowments

An increasingly common way in which corporations seek to build a more entrepreneurship-friendly brand is by offering formalised *intermediary* support programmes such as incubators and accelerators that typically provide co-working space, coaching and mentoring. Following their ‘graduation’ from these programmes, start-ups may be incorporated into the corporation’s business activities, exploit markets as an independent spin-off or get acquired by another corporation (Cohen et al. 2019).

Corporations also increase the *financial resource* capacity of the ecosystem in various ways. Corporations may sponsor monetary prizes for hackathons and competitions or act as strategic investors or financing partners (Foster et al. 2013). They may acquire entrepreneurial businesses to gain access to their capabilities, talent, complementary technology and new markets, thereby offering entrepreneurs and their investors an opportunity to exit and recycle their wealth, experience and know-how (Napier and Hansen 2011; Zahra and Hashai 2022). Senior management in large companies may also become business angels (Mason and Botelho 2014; Spigel 2017).

Further, corporations can impact the local economic, social, cultural and physical *infrastructure*. They have the resources to participate in public-private infrastructure projects and have the power to influence the government to invest in programmes and initiatives that help retain and attract skilled workers and improve the quality of life, all of which strengthen the local ecosystem (Howitt 2019; Katz and Nowak 2018; Spigel and Vinodrai 2021).

One of the most critical roles that corporations play is as *talent* magnets, recruiting highly skilled workers from outside the ecosystem (Harrison, Cooper, and Mason 2004). Moreover, they upskill their employees with on-the-job training and career development, notably by providing opportunities for ‘horizontal’ career changes which enriches the local labour market. However, employees in established corporations are likely to have little incentive to leave their comfortable, highly-compensated positions to move to a start-up or to start their own business, which has a negative impact on entrepreneurial activity in their region (Ryan et al. 2021). On the other hand, ‘displacement effects’ (Shapiro and Sokol 1982) resulting from disruptive corporate events involving restructuring, contraction and closure may prompt their employees to join or form start-ups (Spigel and Vinodrai 2021).

A further important role of corporations in an ecosystem is as customers of start-ups. Motivated by the desire to improve their operations, large companies may engage with

start-ups to help them develop their products and take them to market. Moreover, as early adopters, corporations signal the start-up's credibility in the marketplace (Chesbrough 2006; Zahra and Hashai 2022). Once the business idea takes off, strong local *demand* is crucial for the start-up's growth (Isenberg 2011).

Moreover, large exogenous firms can connect local firms to global markets, which may be especially critical in peripheral regions (Ryan et al. 2021) and in the case of 'born globals', which focus on rapid internationalisation from their inception (Velt, Torkkeli, and Saarenketo 2018). Start-ups can also benefit from strategic business partnerships ranging from relatively short-term, transactional engagement to long-term, committed relationships and product co-development partnerships. From the corporation's perspective, a partnership can solve specific business problems and offer access to cutting-edge technologies and new business models (Chesbrough 2006).

Finally, large locally headquartered businesses are likely to have 'a strong commitment to the local area' (Mason and Brown 2014, 9). Their senior management may reinvest their experience as mentors and institution builders and act as entrepreneurial *leaders* (Mason and Brown 2014). Successful corporations also act as 'lighthouses' for their ecosystems, demonstrating that it is possible to create a successful venture in the region (Napier and Hansen 2011).

## 2.2. Institutional arrangements

Although the resources in ecosystems are crucial for entrepreneurial success, institutional arrangements, such as formal regulations, unwritten rules and attitudes, legitimise, regulate and incentivise entrepreneurial activity, with social networks being critical for accessing the ecosystem's resources (Stam and van de Ven 2021).

First, corporations can provide input into the design and implementation of *policies* aimed at entrepreneurship through their influence on local politicians (Spigel and Vinodrai 2021). But their interests are likely to differ from those of local businesses, hence 'policies favouring the market incumbent that has a monopoly of the market and close ties to the government' (Drexler et al. 2014, 84) can have adverse effects on entrepreneurial activity.

Second, large anchor firms can foster a *culture* of entrepreneurship. The successes of locally-founded companies that have grown to globally-leading businesses provide role models that boost confidence in entrepreneurship and risk-taking (Spigel and Vinodrai 2021). And they can enhance collective entrepreneurial mindsets through hosting business plan competitions and hackathons (Chesbrough 2006). However, as the case of the oil and gas industry in Calgary illustrates, regions that are dominated by industries with distinctive norms and cultures may result in entrepreneurship having lower social value (Spigel 2017).

Third, large corporations can also help build local *networks*. Corporate-sponsored start-up events, event spaces, accelerators and incubators foster a supportive community characterised by knowledge-sharing, feedback processes and emotional encouragement (Goswami, Mitchell, and Bhagavatula 2018). Senior corporate managers can also act as 'connectors', linking entrepreneurs with sources of support and information (Sweeney 1987).

Further, industrial clusters with deep and well-connected networks tend to develop around large corporations. These clusters often spawn further entrepreneurial activity

		Literature review	+/-
Resource endowments	Intermediaries	<ul style="list-style-type: none"> <li>• Co-working spaces</li> <li>• Incubator, accelerator</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> </ul>
	Finance	<ul style="list-style-type: none"> <li>• CVC as financial resource</li> <li>• Acquisitions as exit opportunities</li> <li>• Create pools of business angels and venture capital</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> </ul>
	Physical infrastructure	<ul style="list-style-type: none"> <li>• Support infrastructure developments</li> </ul>	<ul style="list-style-type: none"> <li>+</li> </ul>
	Talent	<ul style="list-style-type: none"> <li>• Talent magnets for high-skilled labour</li> <li>• Training providers</li> <li>• Incubator organisation</li> <li>• Whale fall</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>
	Knowledge	<ul style="list-style-type: none"> <li>• New market opportunities               <ul style="list-style-type: none"> <li>– Complementary products, market research, outsourcing</li> <li>– Access to global markets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> </ul>
	Demand	<ul style="list-style-type: none"> <li>• Customers' proof of concept</li> <li>• Strategic partnerships</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> </ul>
	Leadership	<ul style="list-style-type: none"> <li>• Role models/ lighthouses</li> </ul>	<ul style="list-style-type: none"> <li>+</li> </ul>
	Institutional arrangements	Culture	<ul style="list-style-type: none"> <li>• Entrepreneurial aspirations               <ul style="list-style-type: none"> <li>– Disseminate a risk-taking culture</li> <li>– Legitimize entrepreneurial mind-sets</li> </ul> </li> <li>• Influence of dominant industries</li> </ul>
Networks		<ul style="list-style-type: none"> <li>• Networks               <ul style="list-style-type: none"> <li>– Connect to branches in innovative places</li> </ul> </li> <li>• Events</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> </ul>
Policy		<ul style="list-style-type: none"> <li>• Representative voices of regional businesses</li> <li>• Monopoly-focused policies</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>–</li> </ul>
Legend		+ Positive effect    – Negative effect    0 No clear direction of impact	

**Figure 2.** The role of large firms in entrepreneurial ecosystems: summary.

in that industry. However, this may create difficulties for entrepreneurs outside of the dominant cluster in accessing the ecosystem's labour pool, investment capital, and social networks (Spigel 2017).

### 2.3. Summary

The available evidence identifies various impacts that corporations can have on each of the domains of their entrepreneurial ecosystem. These are summarised in Figure 2. However, the existing empirical evidence is both fragmentary and superficial, hence there is a need for in-depth studies of the roles that large corporations play and how they impact their local ecosystems. Our review suggests that many are beneficial, but some may have detrimental outcomes. And it is not clear whether the benefits that arise from the influence of corporations on individual ecosystem components and local entrepreneurial activity outweigh the disadvantages. This study – which examines how corporations shape the configuration of the Munich entrepreneurial ecosystem – is the first to address this important gap in the entrepreneurial ecosystem literature.

### 3. Methodology

As entrepreneurial ecosystems cannot be understood without considering their unique geographical context (Isenberg 2011), a single case study design was adopted. The case study is a powerful tool to analyse a complex real-life phenomenon that can provide empirical and theoretical insights to guide future research (Yin 1994). We focused on Munich, whose ecosystem has a robust corporate sector, which makes it a suitable critical case to answer our research question. By adopting a single case study, we were able to capture the impact of corporations on the ecosystem dynamics in depth whilst also recognising the role of context (Flyvbjerg 2006).

#### 3.1. The setting: Munich's entrepreneurial ecosystem

Munich is the economic heart of Germany. The region is the headquarters of seven blue-chip companies listed on the DAX: Allianz, BMW, Munich Re, MTU Aero Engines, Infineon, Siemens and Siemens Energy. For the past decade it has ranked first in the 'stock market league' of German cities, based on market capitalisation. Moreover, the city's international connectedness has attracted the European headquarters and innovation labs of various multinational companies including Airbus, Lufthansa, Microsoft, Amazon, IBM and Telefonica (Colantonio, Burdett, and Rode 2014). The city is now recognised globally as a rising entrepreneurial ecosystem, ranking as the 37th most successful start-up hub in the world and seventh in Europe (Startup Genome 2023). It therefore provides an exemplary context to investigate the interdependencies between a thriving corporate sector and a growing entrepreneurial ecosystem.

#### 3.2. Data sources

The primary data source was semi-structured interviews with 15 local stakeholders. The participants for this study were recruited via purposive sampling (Eisenhardt and Graebner 1989) based on their knowledge of the role of corporations in the Munich ecosystem, which was our unit of analysis. All informants, listed in Table 1, have played multiple roles in the local ecosystem during their careers. On account of their backgrounds in the startup world, support organisations, and corporations, our respondents were able to comment on the multi-faceted role of corporations from a variety of perspectives. This helped us capture the impact of corporations on the different actors in the ecosystem and thus gain a more nuanced understanding of their dynamics. The interviews lasted 90 minutes on average. While most of the interviews were conducted in English, four were conducted in German and later translated into English to ensure compatibility with the remainder of the data. All the interviews were recorded and relevant passages were transcribed.

In order to increase the reliability and validity of the results, the data were triangulated (Hlady-Rispal and Jouison-Laffitte 2014) with two other sources: documentary evidence and participant observations. Documentary data, such as reports about Munich, a guide for entrepreneurs in Munich, start-up rankings and newspaper articles from both print and online media were gathered and analysed. Although these types of documents are often produced for marketing purposes, they were nevertheless beneficial in summarising

**Table 1.** Overview of Interviewees

Acronym	Current role	Previous relevant roles	Experience includes positions as/in ...		
			Entrepreneur	Corporate	Startup support
I-1	Tech Evangelist (Technology and Fashion Scale-Up), Mentor, Business Angel	Entrepreneur, Multiple co-founding roles	X		X
I-2	Professor for Entrepreneurship, CEO (University's entrepreneurship centre)	Entrepreneur, Manager (High-Tech Sector)	X	X	X
I-3	Managing Director (Private Start-Up Support Organisation)	Manager (Multiple corporates), Co-Founder (University Entrepreneurship Centre)		X	X
I-4	Co-Founder of a FinTech Start-Up		X		
I-5	Head of Industry Cooperation at a Government-supported support organisation, Mentor	Venture Manager (High-tech corporate), Entrepreneur, Director (Multiple Organisations)	X	X	X
I-6	Business Angel and Mentor	Serial-entrepreneur	X		X
I-7	Managing Director (Accelerator of a multinational corporation)	Serial entrepreneur, Director at an independent accelerator program	X	X	X
I-8	Founder (Digital division of a multinational professional services network), CEO (University Entrepreneurship Centre)	Serial entrepreneur	X		X
I-9	CEO (Founders conference, Innovation education provider)	Various positions at start-ups and consultancies	X	X	X
I-10	Manager (Accelerator Program of a Mass Media Company)	Various positions at start-ups and corporates	X		
I-11	Co-Founder, Managing Director (Independent Start-Up Hub and co-working space)	CEO (Digital Venture), Manager (Media Corporate)	X		
I-12	Founder (Business Angel Network), Entrepreneur, Project Manager (Universities Accelerator Programme)		X		
I-13	Project Manager (Start-Up Cooperation at a multinational consultancy)	Entrepreneur, Manager (Multiple corporate accelerator programmes)	X		
I-14	Project Manager (University-affiliated Centre for Innovation and Business Creation)	Entrepreneur, Manager (Multinational consultancy)	X		

key developments in the ecosystem. We also attended seven entrepreneurship events hosted by large corporations, university incubators and accelerators, entrepreneurs and entrepreneurial ventures. We particularly focused on the role that corporations played in these events, such as in sponsoring the event, the event space and providing speakers, and the presence of attendees from the corporate sector. Beyond these insights, our attendance at these events helped us identify several key interview participants.

The subsequent data analysis followed an abductive approach (Timmermans and Tavory 2012), involving iterative analysis loops of moving back and forth between the empirical evidence and established findings from the literature. The coding of the interview data was undertaken as a thematic analysis, which has proven to work with research questions about the representation and construction of specific phenomena in particular contexts and different types of data (Clarke and Braun 2014). We started by using the

Stam and van de Ven (2021) framework to categorise our data into the various ecosystem components. We then coded the data using thematic analysis to identify the key themes pertaining to each corporate category. Finally, we triangulated our findings with the information gathered from the notes taken at events and from secondary sources, both to ensure cross-verification of the claims and also to expand our findings (Eisenhardt and Graebner 1989).

#### 4. The current state of Munich's entrepreneurial ecosystem

Munich is the third-largest city in Germany and the capital of Bavaria. The nearby Alps and the city's unique mix of cultural offerings make it an attractive but also the most expensive German city to live in (Statista 2018, I-7). It is home to various locally-grown global corporations as well as foreign multinational enterprises and a large number of small and mid-sized companies (Evans and Karecha 2014). It has 17 higher education institutions, plus research and development centres, which jointly contribute to Munich's vibrant knowledge base (City of Munich 2023). Taken together with the high quality of life, these private and public institutions attract a highly skilled workforce to the city (Evans and Karecha 2014, I-1, I-2, I-8, I-9). Overall, Munich has an image of an economically-vibrant city where success is highly valued, but despite being the most liberal part of Bavaria it is influenced by the state's conservative and tradition-oriented culture. This extends to the local innovation culture, which is rather cautious and seen as a way to 'protect the status quo rather than to introduce major changes in the Bavarian way of life' (Pfothenauer, Wentland, and Ruge 2023, 11).

The current state of Munich's ecosystem can be evaluated using Stam and Van de Ven's framework (2021) (Figure 3). Munich's start-ups benefit from the city's highly skilled talent pool. In recent years the ecosystem has attracted an increasing amount of investment (Startup Genome 2023, I-1, I-2, I-8, I-9), a growing number of networking and educational events and new corporate start-up incubator and accelerator programmes which all contribute to the creation of a supportive entrepreneurship environment (Munich Startup and dealroom 2020). These developments have resulted in the growth of entrepreneurial activity, especially amongst high-tech and B2B businesses (Raisher, Hermann, and Höfinghoff 2017), culminating in the celebration of Munich's first unicorns<sup>1</sup> in 2018 and 2019 (Munich Startup and dealroom 2020).

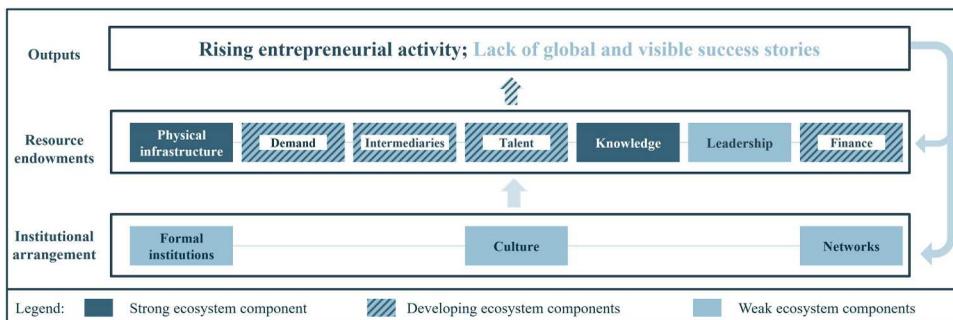


Figure 3. Key findings of Munich's entrepreneurial ecosystem components.

Nevertheless, even though Munich's ecosystem has made significant progress over the past few years, interviewees say that it is still far from realizing its full potential (I-1 to I-15). This is mainly due to its institutional arrangements, which have a negative effect on the ecosystem's rich resource components. For instance, it is missing a 'central hub where [entrepreneurial] people can come together' (I-13). Additionally, the growing number of corporate programmes have been criticised for being weakly connected with each other and with other entrepreneurial hubs and initiatives in the city. Together, these shape the ecosystem's dispersed network (Hubner et al. 2022). Moreover, the ecosystem's culture is characterised by its prevailing risk-avoiding mindset and conservatism (I-15). These features are evident in the absence of a global mindset amongst start-ups, the preference of corporations and other investors for conventional business models and the focus of skilled workers on secure employment and remuneration, all of which inhibit the flow of talent and financial capital to risky, new ventures (Hubner et al. 2022; Schönenberger 2022). Taken together with the high cost of living, this also accounts for the city's lack of diversity which drives visionary ideas and creativity out of the ecosystem (van den Berg et al. 2017, I-1, I-9). This also negatively impacts the city's metropolitan atmosphere, which lacks a 'funky' image, making it unattractive to the creative class who play an important role in creating knowledge-intensive businesses (Florida 2003).

In summary, although Munich's ecosystem produces high rates of early-stage start-ups, it has not yet generated a significant volume of global scale-ups.<sup>2</sup> This deprives the ecosystem of successful entrepreneurs who could inspire the next generation of founders, invest their newly acquired wealth as business angels, venture capitalists and institution builders, and transfer their accumulated experience by becoming network developers and mentors, all of which have a positive influence on an ecosystem's culture, finance, leadership and networking (Mason and Harrison 2006).

## 5. The role of corporations in Munich's entrepreneurial ecosystem

The size of Munich's corporate sector is one of the distinctive features of its entrepreneurial ecosystem (I-11). In this section, we examine the direct and indirect impacts of corporations on each ecosystem component.

### 5.1. Resource endowments

#### 5.1.1. Intermediaries

Although Munich's corporations have a long history of economic success, they are losing their competitiveness due to digitalisation and other disruptive innovations. Hence, they have 'increasingly turned to start-ups to seek new blood and get a second life' (I-1). Currently, almost all of its corporations provide incubator and accelerator programmes (I-7, I-5, I-11, I-13). Although these programmes enrich the ecosystem's resources, corporations are still experimenting with how to set them up in the most effective way (I-1 to I-15).

However, there is a downside to the increasing supply of accelerator and incubator programmes as this may encourage people with less entrepreneurial capability and motivation to start businesses. Moreover, corporate programmes may accept weak start-ups to fill empty spaces, resulting in the phenomenon of 'accelerator hopping' in which start-ups pass through multiple programmes (I-5, I-8). When viewed from a

learning journey perspective, accelerator hopping is not necessarily ‘a bad thing’ (I-8). But when viewed as ‘a way to stay in business’ (I-8), it enables weak start-ups to survive longer, thereby preventing valuable resources from being recycled back into the ecosystem (Spigel and Vinodrai 2021). This raises the start-up rate without necessarily increasing the number of productive start-ups (I-5, I-7, I-15).

Some interviewees questioned the motives of corporations in providing support (I-5, I-7, I-9, I-14, I-15). It was suggested that ‘they want to be cool [...] and [...] change their image as boring companies’ (I-1), rather than to help young ventures to grow. It is also perceived to be a strategy for gaining access to talent, especially in the technology sector, and as an instrument to realise internal cultural change. Consequently, there ‘is a lot of innovation theatre going on at corporations. [It] looks good, [is] lots of fun, [...] but it’s not really value’ (I-8).

### 5.1.2. Finance

Through corporate venture capital investments, corporations can increase the overall financial resources available to high-risk, high-potential young ventures to spur their growth (Motoyama et al. 2013). Although the proportion of Munich’s young ventures which received investments from corporate venture capital funds doubled from 6% in 2016 to 12% in 2017<sup>3</sup> (PwC 2017), it is thought that Munich’s corporations have a vast untapped potential to create additional corporate funds (Schönenberger 2022, I-5, I-7, I-14). Meanwhile, a growing number of senior managers from Munich’s large corporations are becoming business angels (I-5, I-7, I-14), thereby increasing the pool of finance available locally.

Moreover, German corporations rarely acquire start-ups. This is attributed to their fear of cultural clashes (Schönenberger 2022). It has resulted in a lack of local exit opportunities and forced a large proportion of Munich’s founders to sell to foreign multinational corporations (I-7). This often has less beneficial effects on the development of the ecosystem than an acquisition by locally-based companies on account of the possibility that some or all of the activities of the acquired company may be relocated elsewhere (Zahra and Hashai 2022). Moreover, many start-ups, and their investors, pursue an acquisition strategy rather than seeking to scale to a size that makes an IPO an option. Ventures that achieve a public listing are more likely to remain in their local ecosystem, resulting in beneficial spill-over effects, compared with being incorporated into a multinational company (Zahra and Hashai 2022).

### 5.1.3. Physical infrastructure

Corporations are the primary driver of demand for both commercial and residential real estate which drives up prices (Koch and Stahlecker 2006, I-2, I-7). This increases the costs of setting up and running a business in the city. It also makes the city unaffordable for the less affluent and thus reduces its diversity. This indirectly affects the ecosystem’s network and together with ‘it’s arguable lack of “buzz” and “edge” [...]’ (Evans and Karecha 2014, 1276) inhibits the influx of creative individuals (Loots et al. 2021, I-9; Evans and Karecha 2014).

### 5.1.4. Talent

Large corporations contribute significantly to Munich’s flourishing job market (van den Berg et al. 2017), employing a high proportion of the city’s highly-skilled workers and

attracting a significant proportion of them to Munich (Landeshauptstadt München 2018). Once hired, corporations develop the competencies of their employees and enable them to build valuable networks with peers both inside and outside of the organisation, including suppliers, distributors, customers and professional firms. Links to professional communities will also develop if their employers encourage staff to join professional organisations and clubs (I-1, I-4).

However, although corporations make a significant contribution to expanding the ecosystem's talent pool, they nevertheless have an adverse effect on the labour market for start-ups. This is because they 'absorb most of the talent, leaving a relatively low base of recruits for start-ups' (Schönenberger 2014, 102) and drive up the local salary expectations so that 'start-ups could find themselves priced out of the market' (Raisher, Hermann, and Höfinghoff 2017, 104).

Furthermore, a large proportion of Munich's corporations employ '[conservative] people who ... prefer to have a safe job at a big corporation' (I-1) and so are unlikely to be attracted to working in smaller, entrepreneurial businesses. This results in a lack of human capital mobility in the ecosystem. However, the employment preferences of younger talent appear to be shifting from large corporations towards start-ups. The younger generation is now increasingly looking for purpose-driven jobs (I-2, I-7, I-8, I-13) with 'lowered hierarchies, flexible working hours and most important the opportunity to communicate and realise their ideas' (I-4; PwC 2017). Corporations are dominated by rigid structures and so fail to offer the type of employment demanded by younger talent (I-13), whereas start-ups offer a range of responsibilities, diverse roles and unique perks, such as a personal stake in the company (WEF 2018).

Nevertheless, corporations can be a source of entrepreneurial talent. The 'trigger event' which starts the entrepreneurial process often originates in the founder's place of work (Shapero and Sokol 1982). This can be negative – typically dissatisfaction with work or redundancy – or positive – typically identifying a market opportunity related to their work that their employer is not exploiting. It is estimated that half of all Munich's founders who left a job to start their own business (I-5, I-13) detected a need not satisfied by the corporation that they worked for and thus built the solution themselves (I-1, I-4, I-5). However, these spin-off ventures often 'have a local, very specific focus' and are 'often [...] built to be acquired' by a large corporation (I-1). This reflects the limited ambition of Munich's entrepreneurs who typically lack the intent to create global enterprises.

### 5.1.5. Knowledge

Munich's corporations have helped catalyse and strengthen various business clusters in the region (van den Berg 2017). As these clusters span across sectors they 'promote idea flows and allow new ideas to emerge out of the old' (Colantonio, Burdett, and Rode 2014, 150) and hence create new business opportunities for start-ups. But at the same time, national innovation initiatives often favour industrial incumbents who crowd out smaller partners with alternative views of innovation (I-1, I-7, I-13; Pfothenauer, Wentland, and Ruge 2023).

### 5.1.6. Demand

Munich is one of Europe's best-performing high-tech business regions, with a focus on advanced and deep technology (City of Munich 2023). Start-ups in this sector face unique

challenges, including technology risk, high capital intensity, and lengthy time-to-market (de la Tour et al. 2017). Consequently, they have a high requirement to access funding, market access, and technical and business expertise, all of which can be provided by corporations (I-2, I-5, I-7).

The most valuable form of corporate support for start-ups is customer relationships and early product feedback (I-7, I-10, I-13; Isenberg 2011). Hence, corporations are increasingly turning their support programmes towards ‘co-creation’ (I-8), ‘customer-supplier-relationships’ (I-4), ‘sales cooperation’ (I-11), ‘joint-ventures’ (I-13) and ‘winning the corporate as a client’ (I-7). These commercial activities are a critical way in which corporations support the entrepreneurial ecosystem. ‘VCs only invest in one out of 100 companies’ (I-8) and CVC investment in Munich is small, so most start-ups do not have access to finance to scale in advance of revenue generation and profitability and therefore need to generate earnings from commercial activity (I-8). Therefore, they need to ‘do business development, and the best way to do business development is with corporates’ (I-8).

Although these forms of co-operation are crucial for the ecosystem, there are numerous obstacles that undermine their effectiveness. Specifically, delays and undelivered promises from corporations can cause severe consequences for young ventures because of their limited financial capacity (I-4). While some interviewees think that this ‘is just the nature of the corporate beast’ (I-8), others state that corporations at times do not understand the pressures start-ups are facing (I-4). Corporate hierarchies, bureaucratic processes and competition between different departments are further barriers to collaboration (I-1, I-9, I-11). Moreover, there is the risk that once a collaboration is established, the start-up becomes too dependent on the corporation for revenue, potentially distracting it from developing a universal, scalable product, thus harming its efforts to grow its customer base (I-1, I-11, I-14). And a close partnership with one corporation can discourage other corporations from seeking to collaborate which may have a further negative impact on their prospects for scaling-up.

### 5.1.7. Leadership

The literature suggests that corporations act as entrepreneurial role models. However, interviewees disputed this. ‘In Munich, I would not say start-ups get [inspiration] from the corporations. People are inspired by digitalisation and new ways of doing things’ (I-8). However, corporations do act as triggers for disruptive entrepreneurial ventures (Auerswald and Dani 2017). For example, one local FinTech start-up (I-4) emerged from discontent with the profit-driven mentality of major banks and their structures which fostered the desire to create a workplace with flat hierarchies and informal leadership. Once these ventures have grown to successful scale-ups, they – not corporations – act as role models for Munich’s entrepreneurs (I-1, I-4, I-12).

Corporations can act as ‘lighthouses’ that put a region on the map (Napier and Hansen 2011). However, although corporations have given Munich a reputation as an economically successful city (City of Munich 2023), they ‘do not use their brand to make the city more attractive as a start-up hub’ (I-1). Rather, it is scale-ups that can play the role of lighthouses for the ecosystem by proving to local entrepreneurs that ‘you don’t have to be in Silicon Valley to make it’ (Steger 2017). However, despite their achievements,

most of Munich's success stories have received only limited public recognition (I-1, I-10, I-11). And because these local success stories are mostly unrecognised, they do not put Munich on the global ecosystem map.

Corporate anchor firms can take purposeful actions to strengthen the entrepreneurial community (Spigel and Vinodrai 2021). However, in the same way, the local innovation culture thrives on 'a history of close coordination between a core of institutional actors' (Pfothenauer, Wentland, and Ruge 2023, 11), Munich's corporations generally only support and sponsor the 'usual suspects' within the ecosystem, such as entrepreneurship centres at prestigious universities and prominent internationally recognised conferences (I-2, I-8, I-9, I-14), and neglect some of the smaller players and grassroots initiatives. This harms the brokering of new connections and collaborations which are key for innovation within the ecosystem.

## 5.2. Institutional arrangements

### 5.2.1. Culture

Entrepreneurship thrives in settings where it is valued as a worthy occupation and where risk-taking is legitimised (Kibler, Kautonen, and Fink 2014). However, in Munich's prosperous economic environment, people fear the risk of financial loss because of the negative impact on their personal reputation and status (Fuerlinger, Fandl, and Funke 2015). Moreover, corporations are dominated by a conservative mindset (WEF 2018, I-4, I-7, I-13, I-14) and 'care [more] about a solid, working business model than a visionary, big idea' (I-1). This dominant culture deters corporations from collaborating with start-ups and investing in them. This holds back the entrepreneurial aspirations of Munich's entrepreneurs with unproven technologies and business models, with some responding by relocating to Berlin because of its 'funky' image (I-1). Corporations have launched intrapreneurship programmes to revitalise their organisations. However, even though many corporations are now encouraging their employees to adopt entrepreneurial behaviours, there is little spill-over effect in the ecosystem itself or a noticeable cultural shift within the corporate sector (I-5, I-7, I-9, I-14).

Corporations have two further negative effects on the ecosystem's culture. First, corporations are 'building their own islands, have a closed and conservative mindset and are defensive of their ideas' (I-9). This creates a culture of competitiveness rather than 'connected, community-focused thinking' (I-7). Second, corporations are driven by financial considerations rather than altruism (I-1, I-7, I-10, I-13). This corporate culture is absorbed by entrepreneurs who have previously worked for, or with, large corporations, contributing to the prevailing 'transactional thinking' within the ecosystem (I-7, I-14) in which 'people often only offer help if they will get something in return [rather than] because they believe in paying-it-forward' (I-1).

### 5.2.2. Networks

Munich's corporate culture can be harmful to networking activity in the ecosystem (I-1, I-7, I-9). The competitive corporate culture is apparent in their incubators and accelerators, with each building their own internal networks within the ecosystem. Further, the aforementioned 'transactional thinking' of corporates spills over to other ecosystem stakeholders. This potentially impairs the exchange of ideas, experiences and resources.

Further adverse effects are also evident. The high level of salaries in corporations raises the opportunity cost of starting a new venture. This effect is exacerbated by the city's high living costs, for which corporations are partially responsible. Both factors put pressure on entrepreneurs to generate income quickly. Furthermore, although the various events promoted by corporations, such as hackathons, business challenges and meet-ups, can offer entrepreneurs the opportunity to interact with other entrepreneurs, mentors and potential customers, they are generally perceived to have a 'show-character' (I-5), attracting 'innovation wannabees' (I-11) rather than conveying quality content. Some corporations have therefore stopped sponsoring and organising events in order to be taken seriously within the 'real entrepreneurial community' (I-11).

Corporations have the ability to provide entrepreneurs with access to global markets, but this does not occur in Munich where 'big businesses do not do much to connect the city with other hubs' (I-1). The exception is corporate accelerators that cooperate with prestigious global programme partners, such as TechStars, which involves establishing connections to the partner's global locations (Pustovrh, Rangus, and Drnovšek 2020). This builds the ecosystem's external networks and promotes Munich as a start-up hub (I-11). Moreover, other start-up hubs are increasingly interested in partnership with Munich because of its strong market (I-3, I-7, I-11), but this is currently an underdeveloped opportunity for the ecosystem (I-11), as evidenced by Munich's lower global connectivity index compared to Berlin (Startup Genome 2023).

### 5.2.3. Policy

It was not possible to collect information regarding the political involvement of corporations through the interviews because only a few interviewees were part of local political discussions. However, these interviewees reported that corporations only represent the interests of start-ups in political contexts in situations that also serve their needs, such as beneficial changes in corporate taxes and labour laws (I-3, I-7, I-9).

### 5.3. Discussion

The Munich case highlights how corporations, as large and powerful ecosystem actors, shape the configuration of their local entrepreneurial ecosystem, both positively and negatively (Figure 4).

A key contribution of our study is to demonstrate that although corporations provide many valuable resources, as suggested in the literature, they also unintentionally weaken the wider institutional environment in several key respects. On the one hand, corporations provide various incubation and acceleration programmes for start-ups, which help entrepreneurs refine their business ideas and get support from mentors. But on the other hand, their transactional thinking promotes self-interested behaviour which prevents community building and the sharing of best practices among ecosystem actors.

Institutions, such as culture and networks, are crucial for the effective functioning of entrepreneurial ecosystems because they underpin entrepreneurial activity (Spigel 2017). The negative impacts that corporations have on these ecosystem components undermine ecosystem building efforts through their knock-on effect on other ecosystem elements. Most notably, cultural norms simultaneously affect and get reproduced through incubators, accelerators, and community events where entrepreneurs are exposed to learning

		Literature review	+/-	Corporations in Munich
Resource endowments	Intermediaries	<ul style="list-style-type: none"> <li>• Co-working spaces</li> <li>• Incubator, accelerator</li> <li>- /</li> <li>- /</li> <li>- /</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• Co-working spaces</li> <li>• Incubator, accelerator</li> <li>- Cultural clashes</li> <li>- Lack of strategy and measurement metrics</li> <li>- Accelerator hopping</li> <li>- Innovation theatre</li> </ul>
	Finance	<ul style="list-style-type: none"> <li>• CVC as financial resource</li> <li>• Acquisitions as exit opportunities</li> <li>• Create pools of business angels and venture capital</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• CVC increasing, but still small margin</li> <li>• Corporates' hesitation to acquire</li> <li>• Increasing number of business angels</li> </ul>
	Physical infrastructure	<ul style="list-style-type: none"> <li>• Support infrastructure developments</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• /</li> <li>• Drivers of cost level</li> </ul>
	Talent	<ul style="list-style-type: none"> <li>• Talent magnets for high-skilled labour</li> <li>• Training providers</li> <li>• Incubator organisation</li> <li>• Whale fall</li> <li>- /</li> <li>- /</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• Talent magnets for high-skilled labour</li> <li>• Training providers</li> <li>• Incubator organisation</li> <li>-</li> <li>• Employment preferences to self-fulfilment</li> <li>• Absorbents of talent</li> <li>• High salary expectations</li> </ul>
	Knowledge	<ul style="list-style-type: none"> <li>• New market opportunities</li> <li>- Complementary products, market research, outsourcing</li> <li>- Access to global markets</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• New market opportunities</li> <li>- /</li> <li>- /</li> <li>- "Intersectoral-marriages"</li> </ul>
	Demand	<ul style="list-style-type: none"> <li>• Customers' proof of concept</li> <li>• Strategic partnerships</li> <li>- /</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• Customers' for proof-of-concept</li> <li>• Strategic partnerships</li> <li>• Delays, false promises</li> <li>• Dependencies could occur</li> </ul>
	Leadership	<ul style="list-style-type: none"> <li>• Role models/lighthouses</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• Not regarded as role models/lighthouses</li> <li>• Support and collaboration focuses on established partners</li> </ul>
	Institutional arrangements	Culture	<ul style="list-style-type: none"> <li>• Entrepreneurial aspirations</li> <li>- Disseminate a risk-taking culture</li> <li>-</li> <li>- Legitimise entrepreneurial mind-sets</li> <li>- Legitimise entrepreneurial mind-sets</li> <li>• Influence of dominant industries</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>
Networks		<ul style="list-style-type: none"> <li>• Networks</li> <li>- Connect to branches in innovative places</li> <li>- /</li> <li>- /</li> <li>• Events</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• Networks</li> <li>- No efforts to connect the city with other hubs</li> <li>- Indirect connections through incubator/accelerator partner</li> <li>- Attractive as a partner for other hubs</li> <li>• Events</li> <li>• Lower the level of Inclusiveness</li> </ul>
Policy		<ul style="list-style-type: none"> <li>• Representative voices of regional businesses</li> <li>• Monopoly-focused policies</li> <li>- /</li> </ul>	<ul style="list-style-type: none"> <li>+</li> <li>+</li> <li>+</li> </ul>	<ul style="list-style-type: none"> <li>• /</li> <li>• /</li> <li>• Corporations driven by self-interests</li> </ul>
Legend		<ul style="list-style-type: none"> <li>+</li> </ul> Positive effect	<ul style="list-style-type: none"> <li>-</li> </ul> Negative effect	<ul style="list-style-type: none"> <li>0</li> </ul> No clear direction of impact

**Figure 4.** The impact of large corporations on entrepreneurial ecosystems: literature findings and case study evidence.

about how to run their businesses (Wurth, Stam, and Spigel 2022). In particular, promoting a community of like-minded actors is key for successful ecosystem building effort (Thompson et al. 2018). It is therefore essential that a more community-focused – rather than competitive – mindset among corporations is actively promoted. Strengthening collaborative relationships between the currently siloed organisations would improve the distribution and flow of resources by making them more accessible to entrepreneurs, and generally enhancing the performance of the ecosystem (Hruskova forthcoming).

Furthermore, even though both resource injection (Harima, Harima, and Freiling 2021) and entrepreneurial recycling (Mason and Harrison 2006) insert additional resources into the ecosystem, the ecosystem needs to be sufficiently ‘sticky’ to retain and make use of these resources (Markusen 1996). An important factor in ecosystem stickiness is local culture that does not stigmatise failure (Spigel and Vinodrai 2021), but Munich’s risk-averse culture prevents start-ups from ‘failing fast’ (Ries 2011) and therefore delays the release of resources back into the ecosystem. However, since institutions reflect the local socioeconomic context (Rodríguez-Pose 2013), changing the regional entrepreneurship culture takes a long time (Fritsch and Wyrwich 2014).

Our findings represent a major deviation from the one-dimensional view which highlights the positive contribution that corporations make to entrepreneurial ecosystems (Isenberg 2011). Currently, entrepreneurial aspirations in Munich are negatively affected by the risk-averse mentality that prevails in, and spills over from, large corporations, with their conservative mindsets being one of the factors inhibiting the ability of entrepreneurs to develop and exploit their visionary ideas. Ecosystem builders therefore need to recognise both the favourable resource contributions made by large corporations and the adverse effects that they have on the ecosystems institutions and manage these judiciously and with a strategic approach.

Our findings regarding the domains of finance and markets also differ from those in the established literature. The literature review suggested that corporations can offer exit opportunities for local entrepreneurs through acquisitions, which have positive effects through the recycling of entrepreneurial experience and finance (Aaltonen 2016). However, because corporations in Munich are reluctant to invest in local start-ups, it forces them to sell prematurely to global corporations which puts them at risk of relocation, thereby preventing beneficial spill-over effects during scale-up from materialising. Moreover, although the literature has found that large corporations connect their home ecosystems to innovative foreign places where they have branch offices (Ryan et al. 2021), in Munich it was observed that corporations do not attempt to connect the city to other hubs, thereby forgoing valuable linkages of its start-up ecosystem.

Finally, our study has identified new and more nuanced ways in which corporations influence the entrepreneurial ecosystem that have been given less emphasis in the literature. Significant adverse effects include the impacts of corporations on the ecosystem's networking culture, raising salary expectations of skilled workers, and absorbing a large share of skilled talent. Moreover, although corporations can be valuable strategic partners, start-ups risk becoming dependent and subject to high resource demands to conform to the corporation's established policies, procedures and contractual terms. Corporations are also perceived to engage in entrepreneurial initiatives for self-interested reasons rather for the benefit of the wider ecosystem.

In summary, the paper has illustrated the complex ways in which one actor shapes the configuration of their local ecosystem – intentionally or otherwise – and the resulting impact on its resource endowments and functioning, which in turn impacts its effectiveness in generating entrepreneurial activity. By focusing on the interdependencies between the various ecosystem elements (Ghio, Guerini, and Rossi-Lamastra 2019), this study has demonstrated how large corporations may weaken an ecosystem's entrepreneurial activity and innovation, albeit inadvertently, thereby offsetting the positive impact on its resource endowments.

## 6. Conclusion

A critical omission in the entrepreneurial ecosystems literature is the lack of research on the role of large firms. Isenberg's (2013) claim 'you simply cannot have a flourishing entrepreneurship ecosystem without large companies to cultivate it, intentionally or otherwise' is widely accepted. Our evidence from Munich indicates that there is a need to reassess conventional thinking about their role. Corporations certainly contribute to the resource base of the ecosystem; however, their culture and networks have an adverse effect on the institutional arrangements of the entrepreneurial environment.

This adverse effect is reinforced by the conservative, self-interested and risk-prevailing mindset of the corporate sector. Isenberg's view, therefore, lacks nuance and requires significant qualification. It is not automatic that large firms play a positive role in entrepreneurial ecosystems. For this to occur 'requires the businesses to be open and collaborative' (Mason and Brown 2014, 9). This is not the case in Munich.

Although the findings from this study are only a starting point for future research and cannot be generalised to other entrepreneurial ecosystems, as each ecosystem's configuration is unique and tied to its place-specific assets (Isenberg 2011), they nevertheless provide evidence that corporations shape the configuration of an entrepreneurial ecosystem in both positive and negative ways. This endorses the need for a deeper understanding of the roles and interactions of corporations within the complex construct of entrepreneurial ecosystems than is currently found in the literature.

Building on these findings, future investigations should recognise the heterogeneity of 'large firms' by examining the effects of both foreign and locally headquartered businesses. They should also examine the role of different corporate activities (e.g. head office, R&D activity, production, back-office) on their ecosystems. Reflecting the criticism that much of the entrepreneurial ecosystem literature lacks a time dimension, future research should also investigate the effects of changes in the activities of large corporations on the ecosystem in which they are located, looking at both positive transitions, such as the development of advanced technological specialisms (Ryan et al. 2021), and longitudinal studies of the effect of contractions and closures (Spigel and Vinodrai 2021). A further important line of enquiry is the links between large companies and entrepreneurial activity, expanding on the small number of studies that have examined the genealogies of start-ups, but going beyond simply mapping the immediate past employer of founders (Garnsey and Heffernan 2005; Neck et al. 2004) and investigating other types of interaction (e.g. staff recruitment, sales, innovation collaboration). Finally, research should examine the distinctive effects of large companies on specific types of entrepreneurship, such as born globals (Velt, Torkkeli, and Saarenketo 2018), sustainable and social entrepreneurship (Wurth, Stam, and Spigel 2022) and cultural and creative industries (Loots et al. 2021).

From a policy perspective, it is important to recognise that corporations as well as entrepreneurs (Feld 2012) have roles to play in the collective leadership of the entrepreneurial ecosystem that orchestrates the system's multiple independent but interdependent constituents to enable it to generate outcomes for the common good (Autio 2022). However, their relationship is not entirely symbiotic. Entrepreneurial businesses – particularly scale-ups – have different needs and influence. It is therefore important to ensure that corporation-oriented policies do not disadvantage entrepreneurial ventures, particularly those at the nascent stage. Indeed, the leadership in some ecosystems may need to offset the adverse effects that arise from a dominant corporate community which constrain entrepreneurial activity.

## Notes

1. A unicorn is a privately held startup company valued at over US\$1 billion.
2. Scale-ups have been defined by the OECD as companies having an average annualized return of at least 20% in the past 3 years and had at least 10 employees at the start of the 3-year period.

3. In 2018, the study was conducted at national level. From 2019, the annual studies of start-ups in Munich do not distinguish between corporate venture capital and venture capital (e.g. PwC 2019).

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